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Vol. XIV No. 1 January 1979

NATIONAL COUNCIL OF EDUCATIONAL
RESEARCH AND TRAINING

INDIAN EDUCATIONAL REVIEW

☐ **PURPOSE** *Indian Educational Review* is published quarterly in January, April, July and October, by the National Council of Educational Research and Training, New Delhi. The purpose of this journal is to provide a medium for dissemination of educational research and exchange of experience among research workers, scholars, teachers and others interested in educational research and related fields and professions.

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1. Papers that contain original thinking in education or educational research.
2. Papers that make a significant contribution towards developing a theory.
3. Papers that summarize and discuss an outstanding study or a piece of educational research.
4. Papers that review significant research in important areas.
5. Letters to the Editor on important research problems.

The emphasis is on categories 2, 3, 4 and 5. *Ordinarily, a paper is* not accepted if it has appeared in print or in any form elsewhere. Exceptions may be made for contributions which the General Editor

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A QUARTERLY JOURNAL OF EDUCATIONAL RESEARCH

INDIAN EDUCATIONAL REVIEW

VOLUME FOURTEEN NUMBER ONE JANUARY [illegible]

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Indian Students in the United States

Socio-Economic Background, Academic Performance and Plans to Return Home

VICTOR JESUDASON

Council for Social Development, New Delhi

For a large sample of male Indian students who were enrolled in colleges and universities in the USA in 1966, the present study shows that compared to the general population in India, the students came from higher socio-economic status. Among the students, those who were self-supporting were more affluent. Some subgroups were represented among the students in larger proportions than that can be expected from their size in the population. This simply reflects the socio-economic achievement of these subgroups in India. Some subgroups like the Moslems and scheduled castes were under-represented among the students. Compared to the number of Indian students from upper castes and upper classes in prestigious universities (as reported in other studies) the proportion of upper caste/upper class students in this sample is less. This suggests that more students from the lower classes attended less prestigious colleges and universities. A model of the process of plans to return to India was proposed and it was shown that the affluent families were able to ensure that their sons get better grades not only in India but also in the USA, more adequate financial support in the USA, lower degree of homesickness, more years of education in the USA and through these factors ensure that they were less certain to return to India

INDIAN STUDENTS who go to the USA for higher education have been studied from many perspectives. These studies can be classified under four broad categories. First, studies of returned students deal with the impact of foreign education on experience in the home country, contributions of the American visit to international understanding, reverse 'cultural shock', etc. (Useem and Useem, 1955; Scott, 1966; AID, 1966; Dandekar, 1968). The second set of studies deals with attitudinal change, stereotyping, personality development in the foreign context, nonacademic problems, interaction between American and Indian students, etc. (Lambert and Bressler 1956; Dubois 1956, Coelho 1958, Triandis and Fishben 1964; Triandis and Hall 1964; Deutsch 1970, Sharma 1970; Gandhi 1970). Thirdly, some studies deal with academic achievement in the USA and its related areas of policies regarding admissions, counselling, etc. (Tellen 1971). Finally, some studies deal with non-returning Indian students (Niland 1970; Sharma 1970). Although these studies are classified under four headings, most of them deal with more than one area and some with other foreign students in addition to Indian students. A major limitation of all these studies (except Ali 1966 and Sharma 1970, 1971) is that they deal with a small number of Indian students at one or two university campuses only. (For example, Lambert and Bressler studied 16 Indian students enrolled during 1955 at the University of Pennsylvania). Hence, from these studies, it is difficult to draw firm conclusions about Indian students in general.[1]

Theoretical Framework

Although some efforts are made to put together isolated findings and thereby to develop a body of theory about foreign students in general (Walters 1970; Deutsch 1970) as Sewell and Davidson (1961:5) pointed out: "There is no well-established body of theory about cross-cultural educational process available on the basis of which a set of meaningful hypotheses can be formulated and tested".

It is reasonable to assume that a student brings with him a set of more or less well-established skills, aspirations, and values, etc. These are perhaps determined by the students' social background, academic ability and prior experiences. Whatever their prior status may be, since they are students in the USA, the major outcomes of their stay in the USA are their academic performance and expected amount (or years) of education. The foreign student is sometimes referred to as 'sojourner' (Sewell and Davidson 1961). This implies that on completion of their education in the USA they go back to their home countries. The probability of their going back (or not going back) may be determined, in part, by their social

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*The data reported in this paper were collected by Keshev Dev Sharma, and distributed by Professor Robert G. Mayer and Comparative Education Centre at the University of Chicago, and made available through Data and Program Library Service of the University of Wisconsin. The author wishes to thank Dorathy Ellegaard, John Gartrell, Richard D. Lambert and B. D. Shardha for extremely helpful comments at various stages of this work.

[1] Sharma's study (1970, 1971) was comprehensive and based on a national sample of Indian students in the USA, but (though adequate for his purpose) for the most part, he made use of univariate distributions only

origins, academic performance, level of education obtained, and their personal and social experiences in the USA. It is reasonable to expect these students, on their return, to become part of the elites in their home country. This is especially true in underdeveloped countries. Hence, a study of foreign students may illuminate the process of recruitment and formation of the elites in those countries.

The purpose of this paper is to examine: (*i*) the socio-economic origins of Indian students in the USA; (*ii*) their academic achievement and some of its correlates; and (*iii*) their stated plans to return to India on completion of their studies.

Data

The data used in this paper were collected by Keshev Dev Sharma in 1966. A 50 per cent random sample of Indian students enrolled in educational institutions in all parts of the United States was drawn. Out of 3,862 questionnaries mailed out 1,416 (45.4 per cent) useable questionnaires were returned. (For further details regarding sampling, rate of responses and some reasons for non-response, see: Sharma 1971.)[2] On the assumption that the dynamics of educational attainment vary by sex (Jesudason 1972a: 60-63) only males (N 1,275) are included in this analysis.

The questionnaire used by Sharma included a wealth of items relevant to the experiences of Indian students in the USA. Because we planned to carry out multivariate analysis on subgroups we could have produced indigestible quantities of output if we had tried to include every interesting variable in the questionnaire. Hence, we selected only those variables for the analysis which reflected our concern (see Appendix).

Analysis

Statistical Technique for Data Reduction

Three types of analysis are attempted here. In the first we use the familiar method of cross-tabulation, in which the means (where possible) with various characteristics are shown, thus allowing direct comparisons between groups. In the second, we rely on correlation-regression technique—a method that yields a useful and compact summary of the relationships among variables. In the third, an incremental strategy of model building will be used in an effort to generate a multivariate interpretation of relationships among variables. Although the conclusions one reaches from these three types of analysis are the same, cross-tabular analysis is much less abstract, and thus more useful to some readers than the other two. On the other hand, since reality is complex, a multivariate approach may capture reality better.

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[2] Although we have not examined in detail whether non-response is systematic or random, the percentage distributions on certain variables are very similar to such distribution in other independent data sets. Further, the sample is large and so it is possible that the parameters estimated based on this sample may not be biased. Yet we urge that the findings be interpreted with caution. The punched cards were acquired by the Data and Program Library Service of the University of Wisconsin. Multipunches were removed and the IBM cards were made machine readable. In this process, care was taken to maintain the intended meaning of the responses.

Social Origins of Those Who Go to the USA for Higher Education

Sharma (1971) has shown that most of the Indian students in the USA come from the upper end of the stratification continuum, whether it is measured by parental education, occupation, income or caste. For example, in a national sample of those who were in the labour force in India in 1952, 1.4 per cent had a monthly income of Rs. 401 or above, i.e. annual income of about Rs. 5,000 or above (National Sample Survey, 1958-59 : 195, 198). Among those who were students in the USA in 1966, 51.74 per cent reported that their parents had an annual income of more than Rs 5,000. In other words, about 1.4 per cent of those who were in the labour force in India contributed more than 50 per cent of those who went to the USA for higher education.[3]

The first two columns of Table 1 give the number and percentage when students were classified by religion and caste (among Hindus). Brahmins constituted 26.7 per cent of the total or 44.50 per cent of the Hindus and Kshatriyas constituted 12.9 per cent of the total or 21.47 per cent of the Hindus. In a national sample in 1952,[4] among Hindus 9.88 per cent were classified as upper castes—defined as those who according to custom used the sacred thread (National Sample Survey 1958-58 : 17, 27, 28). According to this definition if Brahmins and Kshatriyas are taken as upper castes, 39.5 per cent of all the Indian students in the USA (or 65.97 per cent

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[3] To look at this differently, among the postgraduate students in the University of Poona in 1961-62 Sirsikar (1963 : 49) reports that 24.65 per cent had annual family income over Rs. 4,500. Although Poona is not representative of the nation, this indicates the degree of affluence among the students in the USA when compared with postgraduate students in Poona.

[4] Although the year 1952 is 14 years earlier than the year of interest to us, that is the latest year for which information on caste is available to us for a national sample. Although the proportion of different religions/castes could not have drastically changed from 1952 to 1966, the comparison should be taken as a rough comparison.

TABLE [illegible]

[illegible]

Religion and Hindu Caste	N	Percent	MEANS Father's education	Mother's education	Father's occupation	Parental income (Rs.)
Hinduism						
Brahmins	340	26.67	11.95	8.56	7.17	8126
Kshatriya	164	12.86	11.61	7.18	6.72	9774
Vaishya	185	14.51	11.81	7.28	6.98	9759
Kayastha	55	4.31	12.69	8.91	6.67	7136
Scheduled Castes	20	1.57	9.70	6.50	5.70	9100
Islam	45	3.53	12.58	7.42	7.09	7811
Christianity	90	7.06	11.13	9.09	6.66	6794
Parsi	17	1.33	11.51	11.65	6.29	12824
Jainism	84	6.59	10.69	7.62	7.66	12625
Sikhism	53	4.16	9.56	5.55	5.83	8198
Miscellaneous religions, refused information, no either religion or caste, no information	222	17.41	12.55	8.15	6.74	9038
Total	1275	100.00	—	—	—	—
Grand mean	—	—	12.11	7.94	6.89	8964

among Hindus) come from upper castes. In other words, 9.9 per cent of the Hindus in India contributed about six and a half times their proportion in the population as students in the USA. The same study reports that 20.89 per cent of the Hindus are scheduled castes and they constitute 1.57 per cent (among Hindus, 2.62 per cent) of the students or about one-eighth of their proportion in the population as students. Further, the study reports 8.19 per cent as Muslems and they constitute about one-half of their proportion in the population ; 3.49 per cent as Christians and they contribute about twice their proportion in the population; and 1.41 per cent as Sikhs and they contribute about three times their proportion in the population as students. Among Indian students in the USA some minority groups (upper castes, Kayasthas, Christians, Parsis, Jains, and Sikhs) were represented in greater proportion than their numbers in the population and some others (scheduled castes and Moslems) were under-represented.

In order to examine some aspects of this selection, Table 1 displays the means on four socio-economic status variables by various categories of religion/caste. The parents of Parsi students had the highest mean education and income among all categories of students. The mean father's education of the Brahmins was similar to that of the Parsis but the former's mother's education was much lower than that of the latter. Further, the mean father's occupation of the Brahmins was 7.2 indicating that most of them were professionals. The mean parental income of the Jains was similar to that of the Parsis, but their educational attainment was much lower than most other groups indicating that most of the students were sons of independent wealthy businessmen. Although the mean father's education of the Christians was about one year lower than the mean of the entire sample, the mean mother's education was high next only to that of the Parsis. Further, the difference between mean father's education and mean mother's education of the Christians was about one year, one of the two lowest difference in the entire sample. Although the mean for Christians was lower than the grand mean in the other two variables, the higher level of educational attainment of the mother's and more or less similar educational attainment of both parents perhaps provided them with the incentive to go to the USA for higher education (See also Ross, 1969 : 123).

In contrast to these groups, the scheduled castes had the lowest mean father's education, mother's education, and father's occupation. The Moslems had one of the lowest mean on mother's education, father's occupation, and parental income. This table demonstrates that one of the explanations of why some groups are over-represented and why some are under-represented among the students in the USA was due to their location in the stratification hierarchy in India. (The Sikhs seem to be an exception to this.)

It is of some interest to note that the proportion of Indian students who come from upper classes/upper castes is lower in this sample than that reported by Lambert and Bressler (1956 : 7), Telleen (1971 : 141) and Gandhi (1970 : 98, 99). For example, in the University of Minnesota, Gandhi (1970 : 98, 99) reports that 40 per cent were Brahmins. In this study only 26.67 per cent were Brahmins. It may be recalled that those three studies deal with students enrolled in the University of Pennsylvania, University of Michigan and University of Minnesota, respectively, which are high prestige universities, whereas ours is a national sample. This suggests that more students from lower social classes/lower castes were enrolled in lower prestige universities in the USA.

Selected Characteristics of Those Who Received Different Types of Financial Support

In order to examine whether there were systematic differences among those who obtained different types of financial support, Table 2 displays means and percentages of selected variables by the type of financial support received by the students. For the three subgroups, the mean father's

TABLE 2

MEANS OR PERCENTAGES OF SELECTED VARIABLES BY TYPE OF FINANCIAL SUPPORT FOR EDUCATION : *Indian Students in the USA*, 1966

Variables	*Type of Financial Support*		
	Scholarship (*N* = *293*)	*College/ University* (*N* = *552*)	*Self-supporting* (*N* = *311*)
Father's education (in years)	12.13	12.29	11.85
Mother's education (in years)	7.95	8.01	7.83
Father's occupation	6.87	6.74	7.01
Parental income (Rs.)	8002	8143	10172
Religion caste among Hindus			
Brahmin	29.35	29.89	22.83
Kshatriya	11.95	13.23	13.51
Vaishya	10.58	12.14	26.69
Kayastha	3.75	5.80	2.57
Scheduled castes	3.07	0.91	1.61
Christian	13.65	6.16	3.86
Moslem	1.71	3.26	6.11
Parsi	2.39	0.54	1.61
Jain	4.10	4.35	11.58
Sikh	5.12	3.80	2.25
All others, refused, not available	8.19	13.17	11.90
Married	43.00	34.96	19.94
Age			
24 years or less	20.14	20.65	49.84
25-28 years	26.28	38.77	35.37
29 years or more	53.58	40.58	14.79
Achieved characteristics			
Rank in high school final examination	2.98	3.11	2.66
Rank in baccalaureate examination	3.27	3.32	2.80
Grade point average (USA)	6.37	6.44	5.43
Education expected to obtain	19.34	19.69	18.86
Financial support now receiving (in $'s)	3339	3360	2706

Note : 119 for whom no information was available on financial support are excluded from tabulations.

education, mother's education, and father's occupation were very similar However, the mean parental income was the lowest for scholarship holders and the highest for those who derived their support from their parents and relatives—the difference was about Rs. 2,000 which is substantial Among the affluent who came to the USA for higher education, those who derived support from their parents and relatives were even more affluent

Brahmins and Kshatriyas were more or less equally represented in all the three subgroups. Compared to scholarship holders, almost twice the proportion of Vaishyas, Moslems and Jains were self-supporting But compared to self-supporting students almost twice the proportion of scheduled castes and Sikhs and about four times the proportion of Christians were scholarship-holders. Scheduled castes, Christians and Sikhs were earlier identified (Table 1) as comparatively low on indicators of socio-economic status They had a greater proportion represented among scholarship-holders than among self-supporting students Perhaps, without the aid of scholarships, many of them could not have gone to the USA for higher education. Moslems seem to fair poorly in this respect also

A greater proportion of those who are self-supporting, compared to the other two groups, were not married. The differing age distributions may provide an explanation for this Almost 50 per cent of the self-supporting students were below 24 years of age, whereas in the other two groups about 20 per cent were in that age-group. Further, about 54 per cent of the scholarship holders were 29 years of older whereas about 41 per cent of those who received support from college/university and about 15 per cent of those who were self-supporting were in this age group. The scholarship-holders tend to be older and self-supporting students tend to be younger.

With regard to three indicators of academic achievements (MS Rank, BA Rank, and GPA) the self-supporting students had the lowest mean compared to the other two groups. (For similar findings among graduate students in the University of Michigan, see Telleen 1971 : 86-89.) The means for the scholarship-holders and those who were supported by college/university were similar. Those who are supported by college/university often are expected to perform some services like assisting in teaching or research which may be time-consuming. Yet, their GPA was similar to those supported by scholarships which often does not involve any time-consuming services to the institutions in which they were enrolled. The standard deviation of GPA was larger for the self-supported students than for the other two groups. Thus, although the GPA for self-supporting students was 3.43 (or a letter grade of B) which is just above the probationary level for graduate students in most universities (Telleen 1971 : 167), the larger standard deviation indicates that many had much lower grades. Some of them may be forced to drop out of school before completing their degree. (For a rough estimate of the magnitude of those who drop out, see: Jesudason 1972b.)

Selected Characteristics of Indian Students in the USA

Table 3 describes bivariate relationships for several variables. The four socio-economic status variables (father's education, mother's education, father's occupation, and parental income) had modest positive inter-correlations. The correlations were lower than those reported for other general populations. For example, from the data reported by Sovani, *et al.* (1957: Table. 3.31) for Poona city, among male adults, the correlation between occupation and education can be computed as 0.553 and between occupation and income as 0.591.[5] In this sample, since the variables were skewed to the left, i.e. more observations are found in the upper end of the distribution since the students were specially selected and did not represent the population of India, one would expect lower correlation coefficients among the four indicators of social origin.

Father's education and mother's education had low positive correlation with rank in high school class (HS Rank) and rank in baccalaureate examinations (BA Rank). Father's occupation and parental income had low negative (almost zero) correlations with those two achievement variables. If we sample all those taking high school examinations or all those taking baccalaureate examination we would expect a stronger positive association between socio-economic status and achievement measures.[6] This underscores the fact that the students in this sample were specially selected.

The three measures of academic achievement (HS Rank, BA Rank, and GPA) were positively associated with each other as could be expected. Among the three, the measures of academic achievement in India (HS Rank and BA Rank) were slightly more strongly associated with each other than GPA. BA Rank, which is a measure of achievement at a later point in time than HS Rank, was more strongly associated with GPA than HS Rank.

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[5] The scores assigned to categories of occupations are: unskilled=1, skilled=2, low professional=3, small business=4, supervisory skilled=5, clerical and sales=6, intermediate professions=7, medium business=8, higher professions=9, owners of factories =10. Approximate mid-points were assigned as scores for education and income. Cultivators, beggars, and prostitutes, unemployed and occupation not available were excluded from computations.

[6] Shah, *et al.* (1971: 125) report for a sample of male SSC students in Ahmedabad, academic performance as measured by class mark had a zero-order correlation of .054 with socio-economic status.

TABLE 3

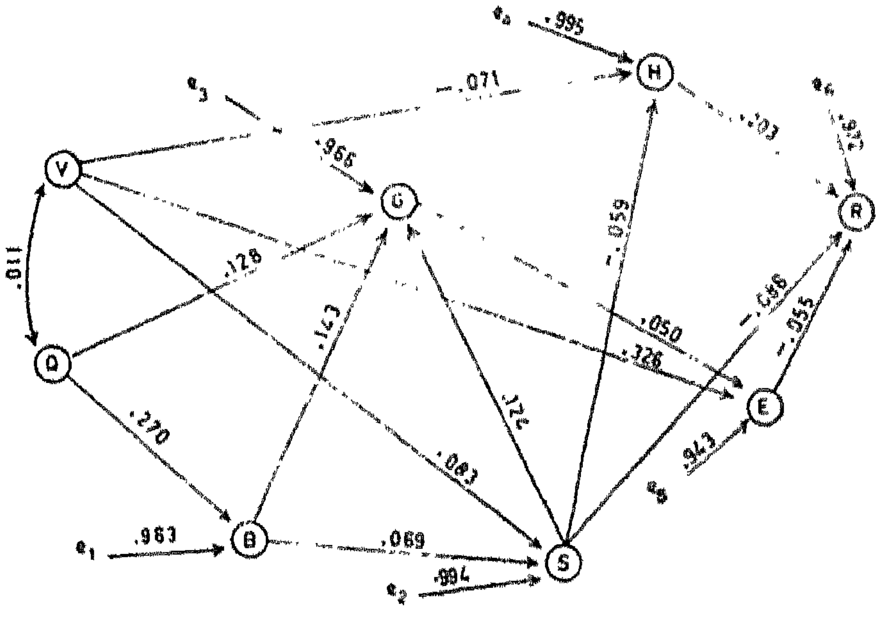
ZERO-ORDER CORRELATION COEFFICIENTS, MEANS AND STANDARD DEVIATIONS OF SELECTED VARIABLES : *Indian Students in the USA*, 1966

	1	2	3	4	5	6	7	8	9	10	11
1. Father's education	1.0										
2. Mother's education	.488	1.0									
3. Father's occupation	.384	.211	1.0								
4. Parental income (Rs.)	.246	.254	.254	1.0							
5. HS rank	.011	.015	.000	—.005	1.0						
6. BA rank	.035	.037	—.011	—.075	.270	1.0					
7. Amount of financial support ($)	.085	.040	.049	.043	.047	.072	1.0				
8. Grade point average	.043	.017	—.003	—.099	.172	.157	.141	1.0			
9. Expected education	.064	—.010	—.045	—.162	.096	.067	.039	.329	1.0		
10. Homesickness	—.076	—.027	—.067	—.099	—.050	—.002	—.065	—.028	—.024	1.0	
11. Plans to return home	—.081	—.034	—.084	—.040	—.014	—.008	—.101	—.027	—.064	.210	1.0
Mean	12.11	7.94	6.89	5964	2.90	3.10	3171	6.08	19.31	0.83	1.01
Standard deviation	4.14	4.01	2.36	6614	2.17	2.01	1413	1.41	1.14	0.65	0.94

HS Rank and BA Rank, were better predictors of GPA than all other variables presented in the table. In other words, those who obtain higher ranks in their school final examination and baccalaureate final examination can be expected to obtain higher scores in the examinations in colleges and universities in the USA.

Further, although the range was not the same in these three variables (HS Rank and BA Rank ranges from 1 to 6 and GPA ranges from 1 to 8) the mean GPA of the entire sample was about twice the size of the means HS Rank and mean BA Rank. The standard deviation, which is a measure of dispersion around the mean, was smaller for GPA than for HS Rank and BA Rank. This indicates that many Indian students in the USA may exert more effort and obtain higher scores in their academic work in the USA than they obtained while they were students in India. (For similar findings about graduate students in University of Michigan, see, Telleen 1971 : 160-178).

A Casual Model of Plans to Return to India on Completion of Studies



A MODEL OF PLANS TO RETURN TO INDIA ON COMPLETION OF STUDIES : *Indian Students in USA*, 1966

Variables : V—father's education, Q—HS Rank, B—BA Rank, S—Financial support now receiving (in $'s), G—GPA, E—Education expected to obtain, R—Plans to return to India.

In the previous section we tried to interpret some of the relationships revealed by Table 3. In this section we will try to combine these relationships in explicit casual interpretations. We make use of path analysis, a technique developed by the geneticist Sewell Wright and introduced into sociology by Duncan (1966). The technique is discussed in several recent articles (e.g. Land 1969) and numerous applications have appeared (e.g. Hauser 1971). Therefore, elaborate discussion of the technique is unnecessary. The path diagram given in the figure (p. 11) depicts the causal ordering of the variables. We assume father's education (V) as a proxy for social origins and rank in high school examination (Q) as an indicator of ability. These two variables are taken to be exogenous variables which are determined outside the model. All other variables in the figure are endogenous variables which the model is designed to explain. The rank in baccalaureate examination (B) comes later in time than Q since one can take B only after taking Q. Since we take Q to be an indicator of ability, we hypothesize B to be caused by Q. The amount of money (in $'s) received by the individual for supporting himself in the USA (S) comes later in time than baccalaureate examination which is taken in India prior to leaving for the USA. We hypothesize that the higher the rank obtained by an individual, the better he will be able to obtain lucrative financial support. Further, the higher the position of the father in the stratification system, the better he will be able to provide money for his son's maintenance in the USA at least for the self-supporting students. Such fathers may also be able to help their sons to obtain lucrative scholarships or assistantships which will provide more money for their support. So, we hypothesize that S is determined by V and B.

Grade point average (G) in the USA occurs after Q and B. For most people (scholarship-holders and those who are supported by college-universities) the amount of money available for support is determined before they come to the USA and so it is temporarily prior to G. We hypothesize that G is determined by Q, B and S. The degree of homesickness experienced by the student (H) was measured at the time of administering the questionnaire. It is assumed to be determined by V and S. The rationale being that we assume that living in the USA involves certain discomforts (like cooking one's food, washing one's clothes, sharing a small apartment with others, etc.). Students from affluent families may experience a greater degree of homesickness when confronted by these discomforts, i.e. the higher the location of an individual in the stratification hierarchy, the greater the degree of homesickness. On the other hand, well educated affluent families perhaps socialize their children in such a way as to develop a Westernized outlook, which could have helped them to adjust very well in the USA and that might result in lower degree of homesickness. In other words, the higher the location of an individual in the stratification hierarchy, the lower the degree of feeling of homesickness. At this juncture, we are not choosing between these two alternatives but rather let the data speak for themselves. The years of education expected to obtain (E) envisages the state of affairs at a future date and, therefore, it is temporarily later than G and H. On the assumption that an affluent father can support his son for longer periods and will not encourage his son to return to India to support his father, we postulate that E is determined by V. Further, the higher the grades a student is able to obtain in the educational system in the USA, the better are his chances of obtaining more years of schooling without dropping out. The plans of an individual to return to India on completion of his studies should come after his education (E) and it is assumed to be determined by S, H, and E.

The figure is a heuristic device to depict the postulated casual and non-casual relationships among the variables under consideration which are verbally expressed above. The curved two-headed arrows indicate the unanalysed relationship between the two exogenous variables V and Q. The straight unidirectional arrows symbolize direct casual influence. Since path analytic technique requires that the system be completely determined, the disturbances and the influence of unanalysed variables (residually defined variables) are indicated by the letter 'e'.

The reader may have noted that we made use of more variables than are included in the model in the earlier part of the analysis. Since this is an exploratory first attempt to develop a model of this nature for Indian students in the USA, we do not want to complicate the model by incorporating too many variables, also, as the term 'model' implies, there is a purposeful selection and manipulation of data. In the words of Duncan, *et al.* (1968 : 9) the purpose of model "is not to construct a faithful portrait of reality, but rather to exhibit and rationalize some of the suspected connections between aspects of reality."

The model as formulated verbally and represented diagramatically can also be rendered algebraically as a set of linear equations. Using the notation of path analysis, we denote the direct effect of variable k on variable j by P_{JK}, and all variables are expressed in standard form. The equations for the model in the figure can be written as :

$$B = P_{BQ}Q + P_{B1}1 \qquad \ldots (1)$$

$$S = P_{SB}B + P_{S2}2 \qquad \ldots (2)$$

$$G = P_{GQ}Q + P_{GB}B + P_{GS}S + P_{G3}3 \qquad \ldots (3)$$

$$H = P_{HS}S + P_{HV}V + P_{H4}4 \qquad \ldots (4)$$

$$E = P_{EG}G + P_{EV}V + P_{E5}5 \qquad \ldots (5)$$

$$R = P_{RH}H + P_{RE}E + P_{RS}S + P_{R6}6 \qquad \ldots (6)$$

where the disturbances, e_j, are taken to be mutually uncorrelated and uncorrelated with regressors in their own and preceding equations. We also use p_{AK} as an abbreviation for $p_{A.K}$. We assume linearity and additivity and estimate the model by least squares.

Since the variables are in standard from, the coefficients (the p's) in the equations are termed 'path coefficients'. In a model like ours they are equivalent to '*beta*-coefficients' or standardized regression coefficients (β). As is conventional for *beta* coefficients, the first subscript denotes the dependent variable and the second subscript the causal or explanatory variable (e.g. p_{EV}). The secondary subscripts, used with *beta*-coefficients to identify variables 'held constant', as in $\beta_{EV.G}$, are not used in the notation for path coefficients. They are obvious from the verbal descriptions or from the diagram. The interpretation of the path coefficients are : In the second equation (for example), for a unit (standard deviation) change in father's education (V) there is, on the average, a change of p_{SV} in financial support now receiving (in $'s) (S). The numerical calculations are presented in Table 4. For the same equation (column 2, first panel)

TABLE 4

EFFECTS OF SELECTED VARIABLES ON VARIOUS DEPENDENT VARIABLES FOR A MODEL OF PLANS TO RETURN TO INDIA ON COMPLETION OF STUDIES : *Indian Students in the U.S.A.*, 1968

Predetermined Variables :						
Standardized regression coefficients						
V	—	.083	—	.071	.064	
Q	.270	—	.128			
B	—	.069	.143	—		
S	—	—	.174	.059	—	.086
G	—	—	—	—	[illegible]	—
H	—	—	—			.201
E	—	—				.053
Coefficient of determination	.073	.012	.066	.009	.110	.055
Regression coefficients						
V	—	2828	—	1.12	1.18	
Q	25.1	—	8.46	—		
B	—	4871	10.2	—	—	—
S	—	—	0126	00278		00784
G	—	—	—	—	26.03	—
H	—	—	—	—		29.7
E	—	—	—	—	—	4.64
Constant	2.37	2679	5.12	1.24	17.56	4.16
Coefficient of alienation	.963	.994	.966	.995	.943	.972

Note: Regression coefficients are multiplied by 100 for convenience in notation. All coefficients are significant at .05 level.

a one-standard deviation (4.11 years from Table 3) shift in father's education (V) produces a 0.083 standard deviation [or (.083) (1413) = 1173. dollars] change in financial support available (S), net of the influence of rank in baccalaureate examination (B). Similarly, a one-standard deviation change in B (or 2.01 points from Table 3) produces 0.069 standard deviation [or (.069) (1413) = 97.50 dollars] change in S, net of the effect V. Although V and B are in different metrics—one in years of schooling and the other in grade points—since they are standardized, their effects on S can be compared.

In the second panel of Table 4, the regression coefficients express the net effect on the dependent variable of a unit change in the predetermined variable. Thus, looking at the corresponding column in the second panel, for each additional year of father's education (V) the amount of financial support available to the student (S) averaged $ 28.28 higher, net of BA rank (B).

Further, for a 'typical' student—by 'typical' we mean his father's educational attainment is at the mean of the simple, and his BA Rank is at the mean of the sample—the predicted amount of financial support is 2679 + (12.11) (28.28) + (3.10) (48.71) or $ 3,172.5, which by definition is the mean amount of financial support (S) (Table 3). For a student whose father has higher level of education, say 16 years or master's degree, but the same level of BA Rank, the predicted amount is 2679 + (16.00) (28.28) + (3.10) (48.71) or $ 3225.9, which is $110.01 higher than that of the 'typical' student. Similarly, for a student with 'typical' father but who obtained distinction (or 5 points) in BA Rank, the predicted amount is $3265.02 or $92.55 higher than 'typical' student. This exercise shows that father's education has greater influence on the amount of financial support received by the student than BA Rank, which can be seen in the first panel of Table 4. For a reader who is familiar with regression analysis, this exercise may be unnecessary. But we present it with the hope that others may be able to follow the interpretations more easily.

In the path diagram depicted in the figure, the number beside the two-headed arrow is the zero-order correlation coefficient (from Table 3). The numbers beside the arrow are path coefficients. As is the convention in path analysis where p's that turned out to be non-significant and negligible in magnitude, the corresponding paths were erased and the equations were recomputed (Duncan 1966 : 7).

From the figure it can be seen that the influence of HS rank (Q) on BA rank (B) is 0.270. It is not surprising that Q as an indicator of ability has a substantial effect on B. Among the two sources of influence on amount of financial support (S), father's education (V) has a stronger influence than B. Decomposing the gross association of S and V (r_{SV}) which is the zero-order correlation coefficient, into its components according to to the basic theorem of path analysis.[7]

r_{SV}	p_{SV}	$+ p_{SB} r_{BV}$	$+ p_{SQ} p_{QB} r_{BV}$
.085	.0828	+ (.693) (.0035)	+ (.0695) (.2699) (.011)
100.00	= 96.92	+ 2.83	+ 0.24
Total Asso-ciation	= Direct Effect	+ Due to asso-ciation with B	+ Due to association with Q

We see that most (96.9 per cent) of the effect of V on S is direct and only about 3 per cent is mediated by ability and achievement.

With regard to GPA (G) the model identifies three sources of influence (in order of importance) : BA rank (B), HS rank (Q), and the amount of financial support (S). Achievement at a later point in time in college (B) has a greater impact on GPA than earlier achievement in high school. It is interesting to see that the amount of financial support available to the student also has a strong impact on GPA which is not too different from the other two sources, namely HS rank and BA rank. It may be that adequate funds avilable to the student facilitate in buying the books and other supplies which may result in higher grades. It is also possible that if adequate funds are available it spares the student from financial worries which may help him to concentrate on his studies. Further, if we could assume, poor grades may force a student to drop out of the educational system, our model shows that affluent fathers are able to ensure an adequate financial support to their offspring (the larger of the two paths : $P_{SV} > P_{BV}$) which in turn facilitates obtaining higher grades and successfully completing their education in the USA.

The model identifies two sources of influence on feelings of homesickness (H), and both are negative. The higher the location of the individual in the stratification system (V), the lower the degree of homesickness; the higher the amount of financial support available, the lower the feeling of homesickness. Decomposing the gross effect of V on H into its components, 93 per cent is direct and about 7 per cent is mediated by S. It may be that the type of socialization found in affluent families or the Western

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[7] The basic theorem of path analysis is :

$$r_{ij} = \sum_k p_{jk} r_{ki}$$

where i and j are any two variables in the system and k runs over all variables in the system from which direct paths lead to variable j.

outlook in which the children are reared prepares them better for life in the USA and consequently they do not report feelings of homesickness It may also be that more than one member of affluent families may be in the USA which also could reduce the feelings of homesickness.[*] For some this may be a second or third visit to the USA which can also reduce the feelings of homesickness. Gandhi (1970 : 100) reports that listening to Indian music alleviated homesickness for Indian students. Perhaps the affluent are able to get music records from India and own equipment to listen to them which in turn could reduce the feelings of homesickness.

Lambert and Bressler (1956 : 8) describe the Indian students in the University of Pennsylvania as 'typical Indians' Klein, *et. al.* (1971 : 86) report that the students from Taiwan who go to the USA are less typical of home culture and traditions. Our study shows that the affluent among the Indian students do not report a greater degree of homesickness and so perhaps the affluent among the Indian students are not typical of home culture.

It is not surprising that the grades an individual obtains in the USA have a greater influence on expected education (E) than father's education (V). In fact, the influence of G is about seven times larger than the influence of V. Perhaps, the students are able to either upwardly or downwardly adjust their expectations realistically using grades as objective criteria. Lambert and Bressler (1956 : 31) point out the aspiration for higher degrees like Ph.D. among some Indian students and refer to it as 'quest for degrees'. Our study shows that although most of the students aspire for a Ph.D. degree – the mean expected education is 19.34 years – the students appear to be rational in their expectations Here again, it is interesting to note that the location in the stratification system (as indicated by father's education) had a modest direct influence on expected years of education and academic achievement in India (Q and B) have no direct influence, except through their influence on G.

Among the three sources of influence on the plans of the students to return home upon completion of their studies (R) the influence of homesickness (H) is positive and substantial. The other two influences, S and B are negative and modest. From the diagram it can be seen that father's education (V) influences plans to return via three other variables. The influence of V on R via H is : $(P_{HV})\ (P_{RH}) = (-.071)\ (.203) = -.014$; similarly, via S being —.007 and via is H —.003—all in the negative direction. This shows that the higher the location of an individual in the stratification hierarchy in

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[*] Out of 300 students studied by Talleen (1971 : 178) 88 or 29.3 per cent gave an address of a friend or relative outside Ann Arbor but within the USA.

India, the lower are their plans to return home on completion of studies. The reader may recall that this is the *stated* plans of the student to return home. Yet, the model clearly demonstrates that the affluent families are able to ensure that their sons get better grades not only in India but also in the USA, more adequate financial support in the USA, lower degree of homesickness, more years of education in the USA and through these factors ensure that they are less certain to return to India. If it could be assumed that a period of study in the USA will enhance the position of an individual in the stratification hierarchy in India, this study demonstrates that the affluent in India not only are able to send their children to the USA but also ensure that they are successful in their educational pursuit in the USA. This is similar to many other patterns of stratification where 'to those who have more, more is given', which is sometimes referred to as 'Mathew effect'.

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Appendix

MEASURE OF VARIABLES

A. *Indicators of social origin* : (1) *Father's education*: the highest level of educational attainment of fathers. The years are coded as: none=0, less than high school=8, high school=10, Intermediate=12, B.A., B.Sc., B.Com.=14, M.A., M.Sc.=16, Ph.D. professional degree=18, Post-doctorate=20. See Tellen (1971 [illegible]) for similar coding. (2) *Mother's education*—the highest level of education of mothers. Coded as above. (3) *Father's occupation*—the occupation pursued by the father of the respondent and in the case of those who have retired, the occupation prior to retirement. The variable is coded as: professional=8, proprietor=7, sales=6, clerical=5, farmer=4, skilled worker=3, service and unskilled worker=2. Although this is not an ideal coding of occupations, we experimented with different types of coding and none seems to work any better. (4) *Parental annual income* as reported by the respondent in income classes and was coded at the mid point of the class interval.

B. *Indicators of prior achievement* : (1) *Rank in High school final examination (HS rank)*—the outcome of final examination on completion of high school courses as reported by the respondent. It is coded as: third or pass division=1, second division=2, first division=3, honours division=4, distinction=5, medals and prizes=6. (2) *Rank in Baccalaureate examination (BA rank)*—the outcome of B.A./B.Sc. examination. It is coded as the above variables.

C. *Financial support now receiving (in dollars)*: The amount of financial support (in dollars) which the respondent was receiving to support himself in the USA. Presumably this did not include the amount of money paid by a supporting organization (where applicable) directly to the institution for tuition fees, insurance premiums, etc. nor the cost of travel to the USA.

D. *Grade point average (GPA)* : The cumulative grade point average as reported by the respondent. It is coded as: A=8, A-=7, B+=6, B=5, B-=4, C+=3, C=2, less than C=1. For similar coding see, Tellen (1971 : 20).

E. *Education expected to obtain* ; The highest degree the respondent hoped to obtain in the USA. It is coded into years of education as B.A./B.S.=16, M.A./M.S.=18, professional degree=19, Ph.D. degree=20. See, Jesudason (1972 : 30-32) for a rationale for the coding scheme.

F. *Feeling of homesickness* : The degree of homesickness as reported by the respondent. It is coded as: feel very homesick=2, feel moderately homesick=1, never feel homesick -0. In all these variables about 10 to 15 per cent of the respondents did not respond to one or more items. (Sixteen did not respond to the item : sex !) A computing routine which computes means, standard deviations and correlation coefficients by bivariate subsample method and cross-tabulations were used to examine whether item non-response followed a pattern. As no discernible pattern could be detected, the mean of a particular variable was substituted for missing data. This resulted in attenuated correlation coefficients. So the parameters estimated will be smaller in magnitude and they should be taken as lower bound estimates only.

G. *Plans to return to India* : The plans of the respondent to return to India after completion of his studies in the USA. The higher the score on this scale greater the certainty of return to India. It is coded as : certainly will return - 4, probably will return - 3, undecided - 2, probably will not return - 1, certainly will not return - 0.

H. *Types of financial support* : The major source of financial support for education as reported by the respondent. The responses were grouped into three categories : *(i) scholarship* from the Government of India, Government of Home State, U. S. Government, U. S. Foundations or International agencies, *(ii)* research or teaching assistantships from college university where enrolled, *(iii)* gifts and loans from parents and relatives and personal savings. The respondents (119) who either did not provide information or who could not be classified into any one of the three categories, were excluded from some of the analysis. Some of the students had more than one source of financial support at least one source for travel to the USA, another for tuition and other fees and perhaps yet another for living expenses. In this data, 38.9 per cent reported more than one source of financial support. Further, it is possible that some who come to the USA with one source of financial support may change the source after a year or two of study. For example, a person may come to the USA as a self-supporting student and after a year or two either by moving out to another university or in the same university may obtain assistantship. In short, classifying students by their sources of financial support is full of conceptual problems. For similar classification and discussion of some of the problems see, Dorai (1969 : 234-235). Our attempt to classify them into three groups in this study was, at best, crude. □

Work Satisfaction and Mental Health

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IN THE WEST the industrial organizations have experienced a phenomenal alienation among workers. Commitment to organization is simply not there. Workers are alienated from work organizations resulting in high absence from work and high turn-over rate Workers do not like to work. The work system is such that it not only fails to sustain the worker's interest in work but it also results in his alienation from work and the work system. Perhaps this is the reason why Ohmann (1955) has questioned whether it would be worthwhile to have productivity even if it destroys personality and human values. For him what happens to people in the course of productivity is far more important than the end-product. During the last one decade or so more and more emphasis is being laid on the quality of working life and human value than ever before. Even the International Labour Organization (ILO) is keenly concerned with humanizing work system. The Director General of ILO, in 1972 conference on 'Technology for Freedom' observed that there are increasing signs of alienation and dissatisfaction at work. Better conditions would do little to abate the revolt against work as a dull monotony offering little opportunity for the exercise of initiative and responsibility. An unsatisfying job may be the means of obtaining the material rewards which, if frustration and dissatisfaction accumulated at work can be contained, may make life outside work more satisfied. The decline of pride in job well done tends to be reflected, among other things, in declined levels of productivity. Wilson (1973) in his report to the U.K. Department of Employment has recently brought out the need for improving the quality of working life. This report deals, among other things, with efficiency at work and the influence of environmental factors. It has been observed that a positive response to work depends upon the factors like the work itself, its structure and organization, its supervision and management, and the needs and expectations brought by the workers to their work situation.

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*An earlier version of this paper was presented at the Sixth Convention of Clinical Psychologists, Varanasi, December 1975.

Trist, *et al.* (1963) have long recognized the need for social technological aspects of the work systems to be jointly optimized and brought into accord with the environmental requirements like economic, cultural, demographic, etc. for achieving performance of tasks at an efficient level. Delamotte and Walker (1974) have shown similar concern for humanization of working life. This movement for improving the quality of working life is closely associated with the question of mental health and hygiene since work does influence human personality.

Job Satisfaction and Mental Health

In a number of studies, it has been constantly observed that the mental health was associated with the job satisfaction the worker gets from doing his work. Kornhauser (1970), for example, has linked up mental health with job satisfaction. A large number of workers in the automobile industry were found to manifest feelings and attitudes and behaviour which reflected unsatisfactory life adjustment. It was found that the mental health varied with the type of work one did; the higher the occupation, the better the average mental health. Similarly, Fraser, while surveying engineering workers in Birmingham, found that 10 to 20 per cent of the workers were having neurosis of some kind. Doll and Jones (1951) have found an association between working life conditions and the psychosomatic disorders like ulcers. Over 25 per cent of American population in a sample survey were found to be having problems at job. This was revealed by Gurin, *et al.* (1960) in their survey. Kasl and French (1962) have found that the nature of job and job status were linked up with the mental health of the worker. The job stress was found to be associated with the job satisfaction in studies by Mann and Williams (1962), Rennie and Srole (1956), Doll and Jones (1951). Numerous studies undertaken at the Survey Research Center, University of Michigan, over the last 20 years, have found a variety of mental health problems related to the absence of job satisfaction. These include certain psychosomatic illnesses, low self-esteem, anxiety, worry, tension, and impaired interpersonal relations. Adaptation in low-level jobs occurs with limiting aspirations and expectations, resulting in great deficiency in mental health because of lack of involvement in the job.

Murthy (1969) has found that low neurotics were more satisfied with their job than the high neurotics. In a study among Indian workers Mehdi and Sinha (1971) have also supported the findings of Murthy that workers with low neurosis were having higher job satisfaction but found a negative correlation between neurosis and job satisfaction. Similarly, Guha (1968) found that job satisfaction had negative correlation with neuroticism.

De (1975) summarizing significant findings concerning work situation and mental health observes that job satisfaction varies with job's skill level; dull, repetitive, unchallenging, low paying jobs are rated low in satisfaction. While an occupant of an intellectual role would in 83-92 per cent cases chose same jobs if offered an opportunity; but as low as only 16 per cent unskilled workers would chose their job again. Workers with low mental health and job satisfaction are found to be escapist or passive in their non-work activities. These workers lack interest in trade unions, voluntary bodies, political and social awareness. They over-react and are aggressive, rigid and inconsistent in their behaviour. Self-esteem correlates strongly with job satisfaction and mental health. Dull and monotonous work leads to low aspiration level and low initiative.

Kornhauser (1970) summarizing results of his study with automobile workers observed that large number of these workers manifested feeling, attitudes and behaviour that signify none too satisfactory life adjustment or mental health. Mental health varied with levels of job and this relationship was genuine since mental health depends on job satisfaction. More severe deprivations and frustrations in lower level job resulted in poorer mental health. In each occupational category workers with higher satisfaction enjoyed better mental health. With partialling out job satisfaction influence mental health differences between occupations diminished. Job satisfaction or dissatisfaction arise from attributes of work situation which is liked or disliked. Whether the job offered opportunity for use of abilities and for associated feelings of interest, sense of accomplishment, personal growth and self respect, was most important. Feelings with regard to income and financial stress were also quite important. Several aspects of job also had some relationship with mental health. These are : the pace, intensity and repetitiveness of work operations; supervision and other human relations on the job, and opportunity for advancement and improved social status.

Job Content and Mental Health

Job satisfaction being a function of job content and mental health being a function of job satisfaction, there is a strong case for job enrichment.

Job enrichment would probably have strong relationship with positive mental health. Most authors in industrial mental health have adopted negative criteria of mental health. While mental health problem could result from job related conflicts and anxieties it is also possible that the job enriched in content might result in positive gain in mental health. Unless we are prepared to examine the extent to which job enrichment helps in positive gain in mental health it would be back seat driving if we claim that job satisfaction helps retain mental health via occupational level.

The cohesive work groups tend to reduce tension in job situation (Seashore, 1954). It is perhaps better to have cohesive work groups for having mentally healthier workers. But in a situation where the cohesiveness of the group does not tend to increase productivity but only helps the members of the group overcome tension related with the job, this might not be helpful to the employer. Kahn, *et al.* (1964) have found that industrial employees in role conflicts had more tension stemming from their work. The role ambiguity created role conflict which resulted in tension at work. Role conflict was much more disturbing for those who were having their personality with predisposition for neurosis..

Delamette and Walker (1974), Alderfer (1959), Emery (1974) and others while pleading for humanization of work are not really unduly worried about the inhuman element in job content. Marx over a century ago had recognized the alienating effect of man-machine system. Today this alienation is complete since the man-machine systems have become very complex. Stress, alienation and anxieties have become part of our daily life. Alienation created by the man-machine system affects our family life; unhappy worker would also be an unhappy man at home. How the job situation is shaping our personalities, our family and society at large is problem which needs investigation and remedy. Our work is such that it dehumanizes; our social structure is such that it alienates; our family structure is such that it generates dependence. How each one is associated with the other ? This claim of family generating dependence; job dehumanizing us via social structure alienating us; has to be broken.

Dependence in bureaucratic organizations is perhaps the most important work motivator (Agrawal 1973). We work because of our dependence on our immediate superior. His directions, criticism, encouragement, informal relations, ability to help, etc. become important consideration than intrinsic variables such as autonomy, growth, work itself, achievement, self-actualization, and so on. Incentives are also quite important but in the government system the incentives and benefits are also linked up with dependence motivation. Dependence is certainly not an indicator of positive mental health, while intrinsic factors are positive indicators of mental health.

While it may be true that dependence is generated by the work system, it also perhaps generates deformity of personality. It is interesting the way dependence in work situation influences the worker's family life. These workers, perhaps, develop defence mechanisms while facing family problems as they do at their work. Family dynamics of these workers becomes as important as the dynamics in the work system also.

Dependence and lack of role clarity might create fear of authority. Dependence and fear result in lack of trust. No trust with lack of power and autonomy might result in immaturity. Immaturity results in lack of voluntary discipline. Leisure becomes more important alternative to work; not working becomes socially more acceptable. Improvement in the quality of work life and humanization of work system may help restoration of positive mental health. Most work on humanization of work life is concentrated in man-machine systems in highly mechanized industries.

Participation and Mental Health

While reviewing more than 100 studies in the past 20 years Kahn (1972) has shown that what workers want most is to become masters of their immediate environment and to feel that their work and they themselves are important. What they hated most was probably the constant supervision and coercion, lack of variety, monotony, meaningless tasks, and isolation. Kornhauser (1970) has indicated that the most important attribute of the work situation related to mental health was the opportunity the work offered—or failed to offer—for use of worker's abilities and for associated feelings of interest, sense of accomplishment, personal growth, and self respect. While discussing the reciprocation function of workers and the company Levinson, *et. al.* (1962) have emphasized need for independence and autonomy in jobs. A mentally healthy person has many different sources of satisfaction. Here there is a strong case for job redesign. We will have to evolve such socio-technical system where we can form autonomous work groups or self-management team who can be given collective responsibility of the production process. Activities performed by such departments as maintenance, quality control, custodial, industrial engineering, and personnel units, should be the team's responsibility. They should perform quality tests and quality standards. Technology employed should ensure elimination of dull routine jobs as far as possible. Jobs requiring human abilities and responsibility should be designed and assigned to. All tasks should have some element of challenge and acquisition or several skills should be rewarded. Supervision should be limited to facilitate team development and decision process. Managerial decisions should be available down to the operator level. Rules should evolve from collective experience and not imposed from above.

Davis and Trist (1972) have estimated the human outcomes of participative work restructuring. They have found that the percentage of workers expressing satisfaction increased from 58 to 100 on general satisfaction, from 45 to 85 on variety, from 33 to 96 on learning, from 42 to 96 on responsibility, and from 39 to 73 on security. Production cost was out by 30 per cent during the first six months.

In the redesigned work setting workers participate in decisions on their own production methods; the internal distribution of tasks; recruitment; internal leadership; additional tasks to be accepted; and when they should work. Participation through representatives on decision-making bodies is not worthwhile as shown by Yugoslav experience; real involvement in actual working on grassroot or shop floor level is participation. They are able to control activities intimately related to their work. Participation in management through worker representatives has not yielded anything.

Mehta (1976) observes that participation leads to an increased satisfaction. Increased participation and democratization of work system is likely to increase worker's sense of political efficacy along with greater allegiance to democratic institutions. This will increase the possibility of their participation in the wider political democratic spheres. He found that work dissatisfaction was due to the perceived lack of influence and autonomy. Increase in participation may had to enhance work related satisfaction. Participation at work is likely to enhance faith in democratic institutions. Mehta (1976 a) finds that work satisfaction is a function of organizational climate, personality, and need patterns. The personality type relates to need system which in turn determine work satisfaction. Personality, therefore, influences work satisfaction.

Work Satisfaction and Positive Mental Health

Since personality influences work satisfaction, its positive attributes would really determine satisfaction at work. Jahoda (1970) reviewing various mental health models has identified in basic models : Attitude toward self; style and degree of growth, development or self-actualization; integration; autonomy ; perception of reality and mastery over environmental forces.

Solley and Munden (1952) lay down six criteria of positive mental health. Those with positive mental health treated others as individuals, were flexible under stress; obtained gratification from a wide variety of sources (people, ideas, interests, values); accepted their own capacities and limitations and are active and productive. Positive mental health being vital to all of us any model is likely to help us in strengthening our case for job redesign. We can achieve positive mental health only if we can provide the worker with an opportunity to achieve it through real and meaningful participation in work because it is work which gives meaning to life. How can we expect the worker to achieve environmental mastery unless we have provided him with mastery over his work. Autonomy has to be initiated at work for it is only then that the individual will be able achieve independence from social influences and will be able to maximize efficiency in problem-solving elsewhere also. Individuals can treat others as individuals only if they themselves have dignity as individuals.

An examination of various positive mental models would show that what is prerequisite of mental health is also a prerequisite of work satisfaction. Hence, one who lacks mental health would be hardly satisfied at work. Work satisfaction, therefore, has a prerequisite, the mental health. Mental health, not being absence of psychiatric symptoms but positive aspects of one's personality, could be retained in work systems where there is greater participation of the employees. Therefore, there is a case for worker participation and democratization of work system for both work satisfaction and mental health.

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Test and Testing in Teacher Education in India

A Review of Literature

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THE HISTORY OF TESTING IN INDIA IS NOT VERY OLD. Sohan Lal and Bhatia were Indian pioneers in this field. Like their earlier counterparts in Europe they also started with intelligence testing and for obvious reasons took the Western cue.

Our purpose is to classify the tests currently in use in India. A few of these tests are of Indian origin and others are either adaptations or adoptions of the tests available in the UK, Australia or the USA. We have attempted a classification of these tests in the field of Teacher Education. As one would notice all of these are not really tests in the true sense of the term because they include attitude scales, inventories, etc. also. This classification, one hopes, would be useful for teachers proposing to use them for research purposes. For the benefit of the users of these tests, we have given the list of those tests that are available with the Department of Educational Psychology and Foundations of Education, NCERT.

It is a truism to say that scholars working in the field of teacher education have a tendency to undertake field studies, surveys, etc. and do not insist on testing *per se*. But the ones who elect to use a test for the purpose of research are either reluctant users or do not go beyond its mere administration to obtain hypotheticated data.

But these situations are discouraging. Collection of data and its superficial analysis do not add much to the quality of work unless they are further supplemented by some other technique. Apart from this, testing requires a trained person familiar with all aspects of testing but few have the requisite competence. Under such circumstances it becomes very necessary to confirm that the obtained results are reliable.

The tests under use belong to two types: (*i*) those which have been designed and developed for studies in the field of teacher education (either original or adapted) and, (*ii*) psychological tests which are used for measuring intelligence, interests, aptitudes, etc. with a view to collecting other less known facts. A list of the second type of tests is also given towards the end of this paper.

The number of researchers are busy developing either their own tests or adapting the existing ones. Surprisingly researches conducted on unvalidated test items or inadequately adapted tests are also accepted for the award of Ph.D. degrees. What is most painful is that these tests are not even consulted by other researchers. Some of these are sub-standard tests, therefore, figure in individual theses only. The good ones also get treated at par with the sub-standard tests and thus go out of circulation. One could surmise several reasons for this state of affairs: (*i*) People are not sure about the usability of these tests; (*ii*) they are not usable as they could achieve only a single objective and lose relevance thereafter; (*iii*) these tests are not well known and people have preferences for known names, etc.

The studies conducted in this field are so scattered that the prospective researcher is hard put to it to locate a suitable test for his use. He neither has access to all the necessary journals or books. The solitary exception in the field of education is *A Survey of Research in Education* (Buch 1974) which presents a compact picture of all the Indian studies conducted in the field of education till 1974 along with their review. This book covers, among other fields, teacher education, tests and measurement and teaching and teacher behaviour. But the research papers prepared by researchers and published in Indian and foreign journals do not fall within the purview of this book. We have attempted to depart from the line adopted by Buch and others, and have thus broadened the scope of this paper.

The principal objective of the present paper is to review the tests which are currently in use in India. However, a few tests prepared by Western educators and psychologists have also been included. The reasons for including these tests are: (*i*) some Indian researchers might like to adapt these tests or render them into regional languages, (*ii*) they may test their validity and reliability in the Indian context or use them as they are or after making certain modifications. Be that as it may, we feel that these tests have certain degree of relevance for Indian scholar.

The first Ph.D. degree in education was awarded by the University of Bombay in 1943. Until 1949 no one received Ph.D. degree in the field of education. However, in 1950 this figure including M.Ed. degree suddenly shot up to 248. Within the following decade this number had reached 2,400. The tempo has since increased further, particularly after UGC had decided that all lecturers would have to obtain the doctorate degree prior to their confirmation in jobs. Hence the number of research scholars doing work in education has gone up. Numerous research bodies like ICSSR, ICHR, UGC, NCERT and many voluntary agencies have started offering financial assistance to research activities as such. However, for research in education the bodies that specialize are the NCERT and the UGC, and also to some extent the ICSSR.

Even so the bottlenecks in communication of research findings remain. There are very few research journals for research reporting in education. In the field of measurement the work of Udai Pareek in collaboration with T.V. Rao and that of Louis Long and Perin H. Mehta are worth referring to. M.B. Buch's *A Survey of Research in Education* is also significant. But all these publications are quite recent after 1966 onwards. It is an encouraging sign that some work is being done in this direction too.

To start with, we would consider here tests developed in India by Indian researchers. We also propose to present tests developed by researchers other than Indians being used elsewhere. The number of tests in use in the area of teacher education is not very high. Our studies have revealed that the largest number of tests in use fall under the category 'psychological or clinical tests'. However, there are a few that transcend this classification. A few of the other types of tests have been prepared by Indian scholars and are currently in circulation. As already indicated we intend describing tests in the specific area of teacher education alone.

A. Indian Tests

1. *Teaching Aptitude Test* (K. P. PANDEY, 1968)

As the name of the test suggests, it is used for measuring the teaching aptitude of teachers, pupil-teachers and students. This test comprises eight sub-tests, viz. professional knowledge, vocabulary, inferential reasoning, number series, numerical reasoning, logical selection, general information and reading comprehension. The test has been validated against supervisor's rating and final examination marks and the respective correlations are .49 and .62.

2. *Ahluwalia Teachers' Attitude Inventory* (S. P. AHLUWALIA, 1976)

It is a bilingual attitude scale which comprises six sub-scales having 15 items in each of them. The total number of items is 90. There are five categories of responses, viz. strongly agree, agree, undecided, disagree and strongly disagree. The subject has to answer each item by ticking one of these five types of responses. The answer-sheet is provided separately.

The reliability coefficients are as follows :

Split-half	.88
Test-retest (3 months)	.75
Test-retest (9 months)	.78
Rational equivalence (KR 21)	.70

The inventory has content validity too.

3. *The Teacher Attitude Scale* (G. K. SAMANTAROY, 1971)

It is a battery of five scales consisting of 21 items each. These scales measure a particular attitude continuum and the total scale measures an overall attitude of the teachers. The attitude objects which were chosen for the scale are as follows :

i. the teaching profession,
ii. the educational administration,
iii. the pupils,
iv. the subjects of teaching,
v. the community.

The validity and reliability coefficients of the scale are .57 and .83, respectively. The author has also developed a score card which can be used for measuring teaching efficiency. This card is based on the model suggested by the cooperative study of secondary school standards, Washington.

4. *Aptitude Test for Elementary School Teachers in Teaching*
(S. N. SHARMA, 1969)

The original test had 213 items in all but in the final version only 120 items were retained. The test measures teaching aptitude of elementary school teachers.

Three types of reliability coefficients were found. The split-half reliability coefficient was .98 while test-retest coefficient was .97. The KR formula 20 was applied and it gave the coefficient as .89. The predictive validity coefficients with internal assessment and with ratings by a board of instructors were .36 and .42, respectively.

5. *Aptitude Test for Secondary School Teachers* (M. M. SHAH, 1962)

The initial form of the test had [illegible] items which were divided into five sub-tests. The pilot test had 143 items which were further reduced to 120 in the final test.

The reliability coefficients of the test varied from .802 to .878. The validity coefficient was around .602, multiple R of the final test battery was also found out and it was .533. Predictive efficiency was 16 per cent.

6. *Test for Teachers* (B. G. PANDYA, 1972)

This test has been designed for measuring traits that make an individual a good teacher. The test has been standardized on Indian population.

7. *A Battery of Psychological Tests for Prediction of Success in Teaching* (G. P. SHERRY, 1964)

This battery includes four different self-prepared tools: (i) intelligence test, (ii) interest inventory, (iii) personality inventory, and (iv) attitude scale. The validity and reliability coefficients of these tests are as follows:

Tests	Validity Coefficients (range)	Reliability	
		Test retest	Split-half
Intelligence Test	47 — .71	.90	.91
Interest Inventory	.25 — .49	.649	
Personality Inventory	.280 — .570	.766	.860
Attitude Scale	.198 — .554	.649	

8. *Teacher Efficiency Observation Schedule* (M. PRASAD, 1970)

To study the professional efficiency of teachers under process criterion, a teacher efficiency schedule was developed and validated. Validity of the tool was calculated on the basis of 'residual pupils' gain' and 'experts' ratings on sociometry. Reliability was also calculated.

9. *Inventory for Predicting Teacher Efficiency* (JAYAMMA, 1962)

As the name itself shows this measuring tool helps in the prediction of teacher efficiency. This was constructed and standardized for the primary school teachers of Mysore State.

10. *Teacher Efficiency Inventory (in Gujarati)* (S. BHATTACHARYA AND M. M. SHAH, 1966)

The inventory is divided into two sections. There are 50 items in the first section and 30 in the second section. The split-half reliabilities of the first and the second section are .75 and .78, respectively. This was also calculated for the entire test which came to .81.

To find out the validity, the coefficient of correlation between the test scores and principal's ratings on a five-point scale was calculated. It was found to be .63. The predictive validity coefficient was established by correlating internal practical examination marks and the test scores. It was .72.

11. *Achievement Test* (RAM CHANDER)

This test has been developed with a view to find out the relationship of attainment in theory subjects in B. Ed. course with attitude as teacher and teaching efficiency. This may be helpful in reformulating the B. Ed. courses also. The details are not available with us.

12. *Baroda Competence Scale (BGTC)*

This is one of the most widely used tools intended to measure general teaching competence. It contains 21 items divided under such headings : Planning (Pre-Instructional), Presentation (Instructional), Closing, Evaluation and Managerial. The individual is rated on a seven-point scale.

13. *Adorno's F. Scale*

We have three adaptations of this test : (*i*) T. N. GUHA AND G. S. MOHANTHY, 1966. The final form consists of thirty-four items. (*ii*) G. S. PRASAD, 1970. R. S. UHRBROCK, 1962. This test has been intended for teachers. A two-point response system is used for purposes of scoring.

14. *Attitude towards teaching Profession Scale* (SHALINI BHOGLE)

This also is meant for teachers. It is a five-point Likert Scale and has eighteen items in it. For scoring purpose summated ratings are used.

15. *Attitude towards Teaching Profession* (V. V. KATTI AND C. S. BENNUR)

The final form of the test consists of 40 statements. A five-point scale has been used for getting the response. The level for which it has been prepared is secondary school teachers. Likert type summated ratings are used for scoring purpose.

The split-half coefficient of correlation is .76 and the self-correlation of the scale is .96.

16. *Attitude towards Teaching Profession* (P. PONNAMBALAM AND H. VISVESARAN, 1966)

Though this test has been developed for teacher-trainees of basic training colleges yet it can also be used for general population. It has 50 items. The split-half reliability coefficient is .94.

17. *Teacher Attitude Inventory* (E. G. PARAMESWARAN, K. RAVICHANDRA AND T. S. NARAYANA RAO)

This instrument measures teachers' attitudes towards their profession and children. It has 45 items. Summated ratings are used for the purpose of scoring.

18. *Teachers' Quality Rating Scale* (S. B. KAKKAR)

The teacher has to be rated on twelve characteristics. The rating is done on a five-point scale.

The test-retest reliability (mean for each of [illegible] characteristics is .87. The test was validated against H. G. Gough's California Psychological Inventory and the validity coefficients for intellectual efficiency and self-acceptance were .81 and .80, respectively.

19. *Teachers' Self-Evaluation Form* (Y. P. SINHA)

This test has been developed for the self-evaluation of teachers in agricultural universities. The time limit is 20 minutes. It is a checklist and no scoring is done.

20. *Job Satisfaction Inventory (University Teachers)*
(JAYALAKSHMI INDIRESAN, 1973)

The test was prepared to measure job satisfaction of engineering teachers. The total number of items is 30 and the inventory is divided into three parts. The factors included are pay, opportunity for advancement, supervision, co-workers, organization policy and management, working conditions, recognition, achievement and independence. It is a five-point Likert-type scale.

Convergent and discriminant validities have been computed. The reliability coefficients for Part I, II and III were found out separately. In case of Indian sample the coefficients were .873, .948 and .948, respectively, while in case of English sample they were .813, .914 and .955, respectively. Sectional scores and overall scores are possible.

21. *Teacher Efficiency Inventory* (CASE, M. S. UNIVERSITY, BARODA, 1966)

This inventory is in Gujarati. It is divided into two parts. Part I consists of 50 items and only 30 items are given in Part II.

22. *Allport-Vernon Study of Value*

We have two adaptations of this test : (*i*) The author of the first adaptation is R. P. BHATNAGAR and the test is in Hindi. The split-half reliabilities are : Theoretical =.71, Aesthetic =.64, Economic =.78, Social =.61, Political =.76 and Religious =.65. The validity has been computed by correlating individual item with the total score on each respective value scale, and (*ii*) by K. ROYCHOUDHARY.

23. *Allport-Vernon-Lindzey Study of Values*

This test has been adapted by (*i*) V. GEORGE MATHEW and is in English language. Reliabilities range from .55 to .70 and validity correlation coefficients up to .59. M. P. JAISWAL has prepared its Hindi adaptation. (*ii*) S. P. KULSHRESTHA has also done it in Hindi. The split-half reliabilities for theoretical, economic, aesthetic, social, political and religious values are : .87, .85, .83, .89, .80 and .89, respectively. The stability coefficients for all these values are : .92, .90, .88, .90, .91 and .92, respectively. The validity coefficients with Allport's English adaptation of Chaodhary were : .90, .89, .90, .94, .91 and .92, respectively.

Allport-Vernon-Lindzey and Allport-Vernon study of values are related to testing in teacher education only indirectly.

24. *A Scale of Attitude of Secondary School Teachers towards Teaching* (SANTI DUTT)

English and Bengali versions of this test are available. It is a nine-point test. It consists of two forms and each form has 25 statements in it. There is no time-limit. The coefficient of correlation between two forms of the test is .68 (N = 120).

25. *Attitude Scale for the Teaching Profession* (BUREAU OF EDUCATIONAL AND PSYCHOLOGICAL RESEARCH, DAVID HARE TRAINING COLLEGE, CALCUTTA)

It is a 42-item verbal group test. There is no time-limit. The split-half reliability (corrected by Spearman-Brown formula) is .94. Provisional norms have also been provided.

26. *Measurement of Attitudes towards Professional Training (Teachers)* (MALTI SHUKLA, 1954)

It is a questionnaire which is verbal in nature. There are 15 items in it but no time-limit has been proposed.

27. *Personality Inventory for Teachers* (BUREAU OF EDUCATIONAL AND PSYCHOLOGICAL RESEARCH, DAVID HARE TRAINING COLLEGE, CALCUTTA)

It is a verbal group test with 49 statements in it and has no set time-limit. It was validated against teachers' ratings on the traits concerned and the validity coefficients range from .29 to .70.

The above list of tests has been prepared after consulting well-known journals which carry research articles on Teacher Education. It is possible that a few tests may have escaped our notice. We, therefore, do not claim that our listing is exhaustive or even complete. Perhaps the ones missed by us belong to the unused category or are none-too-easy to fathom from obscurity. If we analyse the above list we would find that there are certain aspects of testing which appear to be the favourites of scholars, viz. measurement of teaching efficiency, aptitudes, attitudes towards teaching, etc. but other aspects, like anxiety among teachers, practice of cruelty among teachers, etc. have been largely ignored. At present a group of scholars is busy improving teaching through microteaching technique. A few of these are well-known such as M. B. Buch, R. C. Das, G. B. Shah, B. K. Passi, L. C. Singh, S. M. Joshi. An audio-visual model has also been developed. This also helps in finding out the improvement in teaching. Since it is neither a test nor an inventory, it has not been included in the above list. But one should not underestimate either its importance or significance.

B. Foreign Tests

The number of tests other than the Indian ones which have been used and can be used in studies on teacher education is fairly large. For the sake of convenience these tests have been classified. This has been so done to facilitate researchers to pick and choose the test he may want. For this purpose all the tests described below have been classified under five categories:

I. Rating scales
II. Tests related with pupil-teachers
III. Tests related with teaching methods
IV. Diagnostic tests
V. Miscellaneous including inventories and other tests

I RATING SCALES

E. C. Elliott, A. C. Boyce, W. C. Ruediger and G. D. Strayer are some of those who for the first time used rating scales for evaluating teacher efficiency. Different types of rating scales are in use these days. Some are point scales while others are graphic scales. Other varieties of these scales are diagnostic scales, quality scales, man-to man comparison scales and conduct scales. Some of the frequently used rating scales are given below.

1. *Teacher Rating Scale* (YARROW-RADKE AND J. MARIAN, 1946)

   Details of this test were not available.

2. *A Measure of Student Attitude towards Teacher Effectiveness* (ROBERT BENNETT HAYES, 1961)

   It is a scale which measures attitudes of students towards effective teaching and has fifteen items in it. These items are based on those teacher classroom behaviours which are generally conceded to be desirable.

3. *Rating Scale of Teaching Success* (PETER SANDIFORD AND OTHERS, 1973)

   This work was done at the University of Toronto. To find out the reliability coefficient the Spearman-Brown formula was used. It was found to be .888 and .929, respectively, for the average ratings of two groups of experts and .945 and .899, respectively, for two groups of other judges. Correlations between the ratings were .748 and .707, respectively, indicating validities satisfactory to the investigators.

4. *Rating Scale for Judging Teachers in Service* (H. O. RUGG, 1920)
5. *Torgerson Diagnostic Teacher Rating Scale of Instructional Activities* (T. L. TORGERSON, 1930)
6. *Michigan Education Association Teacher Rating Card*
7. *Schutte Scale for Rating Teachers* (T. H. SCHUTTE, 1923)
8. *Pennsylyania Teacher's Rating Score Card* (PA HARRISBURG)

The fourth scale in this list is a man-to-man comparison scale while the fifth is a diagnostic scale. Michigan Education Association Teacher Rating Card is a point scale. Other two scales are again point scales. All these scales are employed by researchers frequently.

9. *Almy Sorenson Rating Scale for Teachers* (H. C. ALMY AND H. SORENSON, 1930)

Twenty characteristics have been included in this scale. After consulting the Webster dictionary (unabridged) traits were defined. This scale is adapted for use in teacher training institutions and in school systems. Regarding validity and reliability the following correlations were found :

First and second ratings, same raters	.92
Alternately composited quarters (internal consistency)	.94
Dual ratings by different raters	.72
Teaching marks and average ratings	.69
Teaching marks and ratings	.74
Average academic marks and average ratings	.45

II. TESTS RELATED WITH PUPIL-TEACHERS

The tests included under this category have been designed and are being used for measuring different aspects of students' and teachers' behaviour, characteristics of different types of teachers, teacher-student interaction and their attitudes towards each other, etc. In fact these tests constitute one of the most important part of teacher-education research.

1. *38-item Pupil Observation Survey* (POSR) D. J. VELDMAN AND R. F. PEEK, 1963

This instrument measures important aspects of teacher behaviour and thus reduces the everyday observation of pupils' behaviour. The subject does not have to put his/her name on it. The questionnaire consists of eight positively phrased statements about teacher behaviour with a four-point scale of agreement. The categories of responses are completely true (T), more true than false (t), more false than true (f) and completely false (F). These categories are given after each statement.

The factor structure of all the items of POSR was determined by an analysis of the pupil ratings of 554 student-teachers. Five factors were extracted of which three were described as related to the three major patterns of the teachers' classroom behaviour which emerged from the observational data collected as a part of Ryan's teacher characteristics study. These five factors were : (*i*) friendly, cheerful, admired; (*ii*) knowledge, poised; (*iii*) interesting, preferred, (*iv*) strict control, (*v*) democratic procedure.

The test-retest reliability coefficients were Factor I – [illegible], Factor II – .80, Factor III – .79, Factor IV – .71 and Factor V – .66

2. *Work Values Inventory* (D. E. Super, 1962)

This inventory is divided into two parts each having [illegible] paired comparisons, yielding scores for 15 presumed values. It can be used as a test of satisfaction with the work and also to assess one's attitudes towards one's work.

3. *Instructional Objectives Preference Inventory* (W. James Popham and Eva L. Baker 1967)

A list of 20 instructional objectives was prepared. For this, five subject-matters, e. g. the U. S. Constitution, were selected and each transformed into four statements of instructional goals. One of the goals was behaviourally stated and 'important', i. e. a somewhat significant activity. The second goal was behaviourally stated and 'unimportant', i. e. a fairly trivial activity. The third goal was stated in non-behavioural terms but 'important'. The fourth goal was stated non-behaviourally and 'unimportant'. This was done for all the objectives. Now there were four groups (each having five objectives): behavioural-important, behavioural-unimportant, non-behavioural-important and non-behavioural-unimportant.

A modest but significant correlation of .25 was obtained when scores of 50 subjects on the inventory and their observed classroom use of behavioural objectives were correlated. A construct validity study also proved it to be a valid instrument. This study involved an examination of the pre- and post-instructor factor structure on inventory scores of 100 prospective teachers.

4. *Preferred Instructor Characteristic Scale* (J. D. Krumboltz and W. W. Farquhar, 1957)

It is a tool which measures teachers' attitudes towards their pupils. This also helps in measuring teacher's and student's attitudes towards each other and compare them. It is a 36-item scale. Each item has two statements—one describing a cognitive instructor and the other an effective instructor. The student has to select one which describes the type of instructor that appeals to him. If the number of statements describing a cognitive instructor is more than the number of statements describing effective teachers the student is said to have a cognitive attitude in the classroom and vice-versa. A cognitive instructor is that who has abstract classroom goals, is intellectual and feels concerned with imparting information. The effective instructor's classroom goals tend to be emotional adjustment of the student and effective interaction in the classroom.

5. *Objective Test for Discriminating between Prospective or First-Year Teachers and Experienced Superior Teachers* (G. L. Betts, 1935)

The purpose of developing this test is reflected in the title itself. A correlation of .41 was obtained between scores earned on this test by 54 teachers and achievement test scores earned by 1,214 pupils.

6. *Edwards Personal Preference Schedule* (EPPS)
(ALLEN L. EDWARDS, 1959)

Fifteen manifest needs, viz. achievement, deference, order, exhibition, autonomy, affiliation, intraception, succourance, dominance, abasement, nurturance, change, endurance, heterosexuality and aggression are measured by this instrument. Edwards has also elaborated these manifest needs and defined them. This instrument has been very widely used. Perhaps the reasons of its popularity are its interesting variables and non-threatening items. It has been used to compare the need patterns of various professional occupational groups such as nurses, pharmacists, engineers and naval officers.

7. *Flanders' Interaction Analysis Category System* (N. A. FLANDERS, 1960)

It is a system which is used for coding spontaneous verbal communication in the classroom. The data is arranged into a useful 10 × 10 matrix. It is further analysed to study the patterns of teaching and learning.

(*i*) Teacher talk, (*ii*) student talk and (*iii*) silence or confusion are recorded. Teacher talk consisted of four categories of indirect influence: accepts feelings, praises or encourages, accepts and uses student ideas, and asks questions. Included in it were three categories of direct teacher talk: lectures, direction-giving and criticism or expression of authority. Student talk was divided into two categories: student response to teacher and student-initiated talk.

8. *Your Ideal Pupils' Checklist* (E. P. TORRANCE, 1971)

Sixty-two characteristics arranged in alphabetical order constitute this checklist. This was originally developed by drawing upon empirical studies that differentiated some group or groups of highly creative people from a similar group of less creative people.

III. TESTS RELATED WITH TEACHING METHODS

Very few tests have been developed to measure teaching *per se*. Perhaps the reason is that teaching is a process and it is measurable only in terms of the outcome, i. e. achievement of the student. For that purpose we have achievement tests for students of different levels in almost all the subjects. In India such tests have been developed in state languages also and researchers are still working in this direction. As has been mentioned earlier, microteaching is a technique which is in use for assessing teaching method/process and modifying it. Given below are three such tests which fall under this category.

1. *A Conduct Scale for the Measurement of Teaching* ([illegible], 1926)

It is a quality and conduct scale. Details of these tests could not be traced.

2. *Horn-Hellersberg Test*

It is a tool for measuring different levels of imagination and maturity as indicators of success in the teaching profession.

3. *Purdue Teacher's Examination: How I Teach* (IDA B. KELLEY AND KEITH J. PERKINS, 1942)

It is an instrument to measure teachers' knowledge of child development and problems of the children. In this measure various educational practices and teacher-child relationships have been stated and the subject is supposed to mark a choice indicating the degree of his approval or disapproval. Each form of the test includes 75 items of this type. Scoring is direct, i. e. one score is given for one correct answer. There is no provision of correction for guessing.

For determining validity, various criterion groups were compared.

IV. DIAGNOSTIC TESTS

The number of diagnostic tests as compared to other tests is much higher. Perhaps the reason lies in their unelaborate administration. These tests could be put to multiple uses, i. e. for knowing the attitude of teachers, measuring teaching skills, etc. These tests constitute a major part of testing in Teacher Education. A brief description of these tests is given below.

1. *Diagnostic Teacher Rating Scale* (MARRY AMATORA, 1938-42)

This scale which measures pupils' attitudes toward their teachers is made of two things—an Area Scale having seven questions in it and a Diagnostic Checklist having seven statements in it. It has two parallel forms A and B. The Area Scale is given before the Checklist.

The split-half realibility for the Area Scale was between .86 and [illegible] and that for the Checklist ranged between .72 and .81. Regarding validity the correlation range was .09 to .61 between supervisors' attitudes and pupils' attitudes.

2. *A Test for Measuring Teachers' Attitudes toward "Teaching as a Profession"* (RUSSELL ROBINS AND HERBERT H. HUGHES, 1967)

After having consulted literature and undertaking an extensive survey eight criteria were selected. These areas define the concept of profession. They are : (*i*) A profession involves activities and analysis of the literature, (*ii*) A profession commands a body of specialized knowledge, (*iii*) A profession requires extended professional preparation, (*iv*) A profession demands continuous in-service growth, (*v*) A profession affords a life career and permanent membership, (*vi*) A profession sets up its own standards, (*vii*) A profession exalts service above personal gain, and (*viii*) A profession has a strong, closely knit, professional organization.

In all these are 36 pairs of statements and each statement has appeared thrice. An alternate scale was also constructed from 18 other statements.

The test-retest reliability was computed and in one college it was found to be .92 between the original and alternative scales and in another college it was .97. The same for the original scale only (in one college) was found to be .99.

3. *The Attitude Scale* (Edra E. Lipscomb, 1966)

In all there are twenty-four problem situations with 123 attitudinal response statements. Each problem has six or seven such statements. Some of the variables included in this scale are : background of experience, kind and length of teacher preparation, operating philosophy of the school system, principal of the school, written policies of the school, type of community, community needs and desires, etc. To have true attitudinal expressions the method of free response was adopted. The list of responses are such with express bipolar response. It has been developed on the basis of Likert technique.

Raliability coefficient computed by Spearman-Brown correction formula is .80 (standard deviations for the split-halves were 7.44 and 7.10) and Spearman rank correlation coefficient came to .76.

4. *Wilson Teachers' Appraisal Scale* (Howard Wilson, 1948-57)

This scale has two editions · junior and senior. The junior edition is divided into three parts : Personal Appraisal, Course Appraisal and Teacher Rank. The senior edition also has the same section headings plus assignments and examinations. Eighteen qualities have been listed in the senior edition while the number of these qualities in junior edition is fourteen.

5. *A Scale for Measuring Attitude toward Any Teacher* (SMAT)
(H. H. Remmers and his Students)

This scale was developed by L.D Hoshaw in 1936 at Purdue University and edited by Remmers. Statements included in SMAT are based on first-hand information of students' likes and dislikes and the concerned literature. After reducing the number of statements of the initial list and revising them it was administered to 60 Purdue University students and 110 high school students. They ranked the revised list. In this work Thurstone sorting technique was used. Two forms of the scale, each having fifty-five statements, were developed.

The subject (pupil) has to place a plus sign before each statement with which he agrees with reference to his teacher. The median scale value of the attitude score, with a high value indicating a favourable and a low value an unfavourable attitude.

6. *Test of Aptitude for Teaching* (F. A. Moss, T. Hunt and
F. C. Wallace, 1927)

This test is divided into five parts: (1) judgement in teaching situations, (2) reasoning and information concerning school problems, (3) comprehension and retention, (4) observation and recall, and (5) recognition of mental states from facial expression.

Dr. T. Hunt has used this test and has reported correlations to be ranging between .30 and .50 with teachers' ratings, [illegible] with the Social Intelligence Test and .57 with the Mental Alertness Test.

7. *Stanford Educational Aptitude Test* (Milton B. Jensen, 1928)

While administering this aptitude test, norms are obtained for position preference ratings, discipline case problems, high school activities and for the battery as a whole. Three types of comparisons have been provided (*i*) teaching research, (*ii*) research administration, and (*iii*) teaching administration.

The test was also validated. For this purpose [illegible] men were selected on the basis of ratings by [illegible] judges. The correlation was [illegible]. The reliability coefficient for the entire battery was [illegible] but for the three parts separately it was slightly lower. This test seems to be one of the most frequently used tools in this class.

8. *Educational Aptitude Test* (Thelma Hunt and
James Horold Fox, 1940)

This test is divided into six sub-tests, viz. vocabulary, general judgement, logical reasoning, information, comprehension and arithmetic. No data on reliability and validity has been reported by its users.

9. *Coxe-Orleans Prognosis Test of Teaching Ability* (Warren W. Coxe
and Jacob S. Orleans, 1930)

This measure of probable success in the classroom teaching is divided into five subjects : (*i*) General Information—true-false and multiple choice items, (*ii*) Professional Interest—true-false items which have been included in the test for the purpose of measuring informations about methods of teaching and management. This also measures interest but only indirectly. (*iii*) Lessons in Education—sample reading selections in education, (*iv*) Reading Comprehension measuring ability to answer questions over given principles of education to specific practices and (*v*) Problems in Education—items in this part measure the ability to apply given principles of education to specific practices. In all there are 410 items in the test.

To find out coefficients of validity the scores on this test were correlated with achievement test scores. The range of these coefficients is .534

to .839 with an average of .648.

10. *Teacher Attitude Inventory Form II* (NORTH, 1961)

This inventory is a Likert-type scale with 55 items. These items have been classified into four teacher attitude areas, viz. (*i*) Attitude towards teacher-pupil relation (10 items), (*ii*) Attitude towards administration (15 items), (*iii*) Attitude towards profession (13 items), and (*iv*) Attitude towards community (17 items).

11. *Teachers' Attitude Towards Self and Others* (WRIGHT, 1958 ; SHERMAN, 1962, AND TUSKA, 1963)

This instrument has three components : (*i*) A set of 26 semantic differential scales composed of 26 pairs of bipolar adjectives with six discriminal points between each pair of adjectives. The ratings of six concepts, viz. self, father, mother, the best liked teacher, the least liked teacher and the subject as a teacher by the students are obtained on these 26 scales. (*ii*) A set of 18 semantic differential scales composed of 18 pairs of dichotomous statements with similar six discriminal points between each pair. As in case of the first component, the students' ratings of four concepts, viz. the subject as a teacher, the best liked teacher, the least liked teacher and the least competent teacher on these 18 scales are obtained. (*iii*) A set of 20 questions involving affect-loaded interpersonal relationship with mother, father and teacher.

12. *Robertson Student Perception of Teacher Attitude Scale*

Six situations which are common to public school classroom are given in this scale. These are poor performance or achievement, undesirable behaviour, smoking, difference of point of view, scholastic difficulty and improper dress. This scale was developed on the basis of a similar instrument devised by Anderson and Dipboye (1962) which in turn was based on Ann Roe's categorizations of house environments—Rejecting, Demanding, Casual and Accepting.

13. *Minnesota Teacher Attitude Inventory* (COOK, W. WALTER AND OTHERS, 1951).

The purpose of developing this inventory was the determination of the probable person-to-person relationship between the prospective teacher and the students he excepts to teach. This instrument helps in knowing who are the persons in a particular group who should take up teaching assignment and who must go for other professions.

The validity coefficients as reported by the authors are between .50 and .63 for the MTAI when correlated with students' ratings of teacher, experts' ratings of the teacher and the principals' ratings of the teacher.

14. *The Diagnostic Teachers' Rating Scale* (SISTER M. AMATORA TACHECHTELIN, EDITED BY H. H. REMMERS)

This test is divided into two forms. This is meant for grades 4 to 8.

The test has seven scales. Percentile norms have also been provided

15. *Attitude Test for Elementary School Teachers in Training*
(Henry Bowers 1948)

It consists of seven parts Part I—Opinions, Part II—Habits, Pa III—Occupations, Part IV—Interests, Part V—An appraisal of adjustmen Part VI—Performance and Part VII—High school performance

All the first five parts are pencil and paper tests and can be used wit both the sexes. Part VI is essentially a controlled interview. Part V records students' high school record

Scores on this test were validated against teaching marks and th validity coefficient was .70 (N = 10,000)

16. *Teacher's Performance Record* (A. S. Barr and A. E. Harris, 1949)

The purpose of this blank is to assist supervisors in the evaluation an improvement of the teacher's performance in the classroom

17. *Corkhuff's Scales for Empathy, Congruence and Positive Regard*

The details of this test could not be found out

V. MISCELLANEOUS, INCLUDING INVENTORIES AND OTHER TESTS

Under this category all those tests have been included which could no be classified under the four broad categories described earlier

1. *Watson-Glazer Critical Thinking Appraisal* (Goodwin Watson an Edward M. Glazer, 1942)

This test is used for the children of 9 to 16 grades and adults also. Th ability to recognize the validity of arguments, the detection of implication of statements consisting of opinions, etc. have been included in the tes Norms and estimates of reliability are only tentative

2. *Ohio Teaching Record* (Ohio State University Press, 1945)

The record booklet is divided into three sections (i) instructions, (i contains eight observation guides and (iii) suggestions and questions whic might lead to two different but complementary summaries of the anecdo tal records. It has been developed for use in a cooperative inquiry carrie forward by teachers and competent informed observers who are concerne with the improvement of teaching. This record is very useful when use by a highly competent supervisor.

3. *Feshbach Situation Test*

This test consists of 16 story situations of students who are engaged i relevant classroom activities. In two stories a student has been depicte behaving in a manner consistent with one of the four clusters give below.

1. Male (or female) role I : Active, Independent, Assertive (AIA)
2. Male (or female) role II: Dependent, Passive, Acquiscent (DPA)
3. Male (or female) role III: Flexible, Non-conforming, Untidy (FNU)
4. Male (or female) role IV: Rigid, Conforming, Orderly (RCO)

4. *The Purdue Teacher Morale Inventory* (RALPH R. BENTLEY, AVERNO M. REMPEL AND NEEL A. ROSEN, 1961)

The title given on the test is Purdue Teacher Opinionnaire, the number of scores is nine. The areas covered are : teaching as an occupation, relationships with other teachers, administration policies and practices, curriculum factors, relationships with students, relationships with community, working conditions, economic factors, total. Form A runs into 8 pages. No norms for sub-score have been given.

5. *Health Questionnaire of NEA* (NATIONAL EDUCATION ASSOCIATION, 1938)

Health status, personal health practices, mental and emotional health, spiritual health, the effects of school and out-of-school environment on the health of teachers and professional and community responsibility in the promotion of teacher health.

6. *Teacher Education Examination Programme* (EDUCATIONAL TESTING SERVICE, 1957)

This programme is divided into two parts : (*i*) General Professional Examinations: The maximum number of scores is seven. The areas covered are foundations of education, child development and educational psychology, guidance and measurement, instructional methods, English, history, literature, fine arts, science and mathematics. The time given is 185 (245) minutes. (*ii*) Teaching Field Tests : Eleven tests have been included in this. They are related to early childhood education, elementary school education, English language and literature, social studies, biological science, physical science, mathematics, French, Spanish, industrial arts and physical education. The time is 80 (95) minutes per test.

7. *The Teaching Evaluation Record* (DWIGHT E. BEECHER, 1953)

It has only one form No data on reliability has been reported.

8. *National Teacher Examinations Educational Testing Service*

This service is divided into two parts : (*i*) Common Examinations : (6 scores). The areas are professional information, social studies, literature, fine arts, science and mathematics, English expression, non-verbal reasoning, weighted total time : 185 (210) minutes. (*ii*) Optional Examinations: Candidates elect one or more tests. The eleven tests are as follows : Education in the Elementary School, Early Childhood Education, Biology and General Science, English Language and Literature, Industrial Art

Education, Mathematics, Chemistry, Physics and General Science, Social Studies, Physical Education, Business Education, Music Education. The time allotted for each test is 80 (40) minutes.

The 1958 edition of this test has twelve separate test booklets. The biggest is common examinations which measures general knowledge and ability requisite to effective teaching. It consists of five separate tests. Other tests measure specialized professional abilities. All the tests are objective tests.

9. *Teacher Practices Questionnaire* (TPQ) (A. Garth Sorenson, T. R. Husek and Constance Yu, 1963)

The purpose of using this test is to measure role expectations of teachers specially with regard to interpersonal relations. Thirty problem situations have been included in this. Each situation includes a brief description of a student and his behaviour. Against each situation four different role dimensions have been given. Teachers have to rate each alternate course of action separately according to its degree of appropriateness on a five-point scale (*i*) very inappropriate, (*ii*) fairly inappropriate, (*iii*) acceptable, (*iv*) fairly appropriate, (*v*) very appropriate.

The split-half reliability coefficients for scales are (*i*) .77, (*ii*) .80, (*iii*) .86, (*iv*) .93, and (*v*) .86. Low to moderate intercorrelations of the scales (.16 to .52) show the independence of scales from each other.

10. *Teacher Opinionnaire on Democracy* ([illegible] [illegible], Theo F. Lentz and Colleagues, 1941)

This is only one of a battery of instruments to measure such factors as (*i*) The Democraticness of Parents, (*ii*) The Democraticness of the School Process and (*iii*) The Democraticness of the School Product. This has two Forms. Form G has 65 items and Form H also has 64 items.

It has been reported in the manual that "A check of 960 judgments by six judges, made independently of each other to each of the 160 items, revealed an agreement with the key of 934 times, i.e. 97 per cent. Percentile norms were also prepared. The predicted reliability for Form G and H together is close to .93 and for both the Forms separately it is .87.

There are three more tests, viz. Thurstone and Mellinger's Questionnaire for Measuring Psychological Needs, Tennessee Self-Concept Scale (TSCS) and an Inventory to Measure Student Attitude (University of Queens-Land) but the details of these tests have not been reported in the journals. A comprehensive battery has also been brought out under the title 'The Cambridge Survey of Educational Opinions'.

Tools For Measuring Creativity

Both in India as well as abroad considerable work is being done on creativity. It is a new area of interest for educationists. Increased interest in studies on creativity is the result of the idea of educating the child. The concept of genius had already been introduced. One of the characteristics of the genius is his/her creative thinking. Whether creativity is educable made educationists feel themselves more concerned about it. The recent trend in this research is the study of psycho-physiological basis of creativity which is quite interesting.

Creativity has attracted both educationists and psychologists alike. The creative child being the principal cause, all aspects including the origin and expansion of his talent have been under serious study.

A. INDIAN TESTS

Though a number of Indian educationists and psychologists are busy in developing tools for measuring creativity there are only two standard tests. One by Prof. Baquer Mehdi and the other by Prof. B. K. Passi. Besides these two Dr. M. K. Raina (NCERT) is also trying to develop his own tests of creativity.

1. *Verbal Tests of Creative Thinking* (BAQUER MEHDI, 1973)

This battery has been developed on the lines of Guilford Divergent Production Tests (1967) and Torrance Tests of Creative Thinking (1966). This battery has been developed with a view to identify creative talent at all the stages of education excluding pre-primary and primary levels.

There are four sub-tests, viz. consequences test, unusual uses test, similarity test and product improvement test.

Item validity was also computed. Scores on individual items were correlated with the total scores and the correlation ranged from .766 to 1.00. Individual scores were again correlated with the grand total of all the four activities scores and the range was .555 to .768. The verbal and non-verbal creativity tests were correlated with the Raven's Standard Progressive Matrices but very low correlation was found. In case of verbal test this correlation was .194 while in the other case it was .181.

The test-retest reliability coefficients for factors, viz. fluency, flexibility, originality and total scores were .945, .921, .896 and .959, respectively. The validity coefficients for all these were .40, .32, .34 and .39, respectively.

2. *Non-Verbal Test of Creative Thinking* (BAQUER MEHDI, 1973)

This test also has been developed on the lines of Torrance Tests of

Creative Thinking (1966). The purpose of this test is the same as the verbal test by the same author.

Three types of the activities, viz. picture construction, picture completion and triangles and ellipses have been included in this test. The time limit for the administration of the actual test is 35 minutes. It measures individual's ability to deal with figural content in a creative manner.

The test-retest reliability coefficients for Elaboration, Originality and Total score were .932, .947 and .916, respectively (N = [illegible]). The inter-scorer reliabilities using 35 test scripts were found to be [illegible], [illegible] and .917 for the two factor scores and total score respectively.

The three scores were also validated against teacher ratings. The validity coefficients were .349, .329 and [illegible] for Elaboration, Originality and Total scores.

The item scores have been correlated both with total creativity scores as well as the total activity scores. The internal consistency was there.

The range of inter-correlations among the three sub-tests was from .393 to .477.

3. *Test of Creativity* (B. K. Passi, 1971)

The pattern of Guilford, *et al* (1952) was adopted for developing this battery of tests. It consists of six sub-tests, viz. the Seeing Problem Test, the Unusual Use test, the Consequences Test, the Test of Inquisitiveness, the Square Puzzle Test and the Blocks Test of Creativity. The first three tests are verbal tests and the last two non-verbal. In the fourth test the item is non-verbal in nature while the response is verbal.

The test-retest reliability coefficients for the six tests range from .68 to .97 (median r=.83). The split-half coefficients for the verbal tests (only three tests out of six) had a median r .80. It was validated against Things-Done-On-Your-Own checklist, Raven's Standard Progressive Matrices, Jalota's Group Achievement scores and the median validity coefficients found were .60, .27, 27 and .30, respectively. The first coefficient represents convergent validity while the other three represent divergent validity. The factorial validity against verbal creativity and non-verbal creativity factors ranged from .305 to .745.

B. WESTERN TESTS

Four well-known tests of creativity developed by Western researchers are also in use in India. Indian scholars have also adopted these tests. These tests are as follows :

1. *Torrance Tests of Creative Thinking* (E. P. Torrance, 1966)

This test has four batteries of test activities—two verbal and two figural.

Each of these batteries have two equivalent and alternative Forms, i.e. Form A and Form B. Ask-and-Guess Activities, Unusual Uses Activities, Product Improvement Activities, Just Suppose Activities and Unusual Questions have been included in the verbal tests and the figural tests consist of Incomplete Figures Activities, Picture Construction Activities and Repeated Figures Activities.

The test-retest reliability coefficients for verbal and figural Fluency, Flexibility, Originality and Elaboration measures range from .71 to .93.

2. *Guilford Measures of Creativity* (J. P. GUILFORD, 1967)

J. P. Guilford and his associates have worked on creative abilities at University of California. These researches have resulted in Guilford's three-dimensional model known as the "The Structure of Intellect". The model of morphological design includes five operations or processes (cognition, memory, divergent thinking, convergent thinking and evaluation), six products (units, classes, relations systems, transformations and implications) and four contents (figural, symbolic, semantic and behavioural). This suggests that there can be 120 ways of being talented and Guilford (1970) has identified 98 abilities out of them. These abilities have been identified through tests.

3. *Remote Associates Test* (RAT) (MEDNICK AND MEDNICK, 1967)

This test is based on "associative" interpretation of the creative thinking process. It measures ability to form mutually remote associative elements into new and useful combinations. This test has two forms which are used at the college and professional level. It is both a group as well as an individual test.

The Spearman-Brown coefficient of correlation on two samples, one of 215 and the other having 289 subjects came to be .91 and .92, respectively.

Wallach and Kogan's Test of Creativity (WALLACH AND KOGAN, 1965)

This battery has four association type measures—two tasks viz. "uses" and "similarities" involve verbal stimulus materials and the other two "pattern meanings" and line "meanings" deal with visual stimulus materials. These tests have manifested a high degree of internal consistency and are relatively independent of intelligence tests.

The Spearman-Brown reliabilities reported are above .80 and as high as .93.

In India Paramesh (1970) has adapted this test for research purposes.

Apart from these tests there are some psychological tests which have also been used by researchers working in the field of education. There is absolutely no need to go into the details of these tests but a reference to them would not be entirely out of place here. Therefore, a list of some such tests is given on p

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1. Rorschach Ink Blot Test
2. Cattell's 16 PF Test
3. Differential Aptitude Test Battery
4. Washburne Social Adjustment Inventory
5. Thurstone Temperament Schedule
6. Attitude Scales by Wandt, Glassey and Patel
7. Bell's Adjustment Inventory
8. Raven's Progressive Matrices
9. Maudsley Personality Inventory
10. California Psychological Inventory
11. Otis Self-Administering Test of Mental Ability
12. Flanagan's Test of General Ability
13. Cattell's Anxiety Scale Questionnaire
14. Jalota Group Test of General Mental Ability
15. Sexana's *Vyaktitva Parakh Prashnavali*
16. Sinha's Manifest Anxiety Scale
17. Desai Bhatt Verbal Group Test of Intelligence
18. Indian Adaptation of Allport A S Reaction Study
19. Asthana's

Analysis

Teaching is increasingly being studied both as an art and science. Teacher educators are anxious to learn about the traits of a successful teacher. They also wish to know what makes teaching a success. It is, therefore, not at all surprising that in the West, so also in India, numerous tests have been developed on teacher traits, achievements, etc. besides personality inventories. The attitudes of prospective and in-service teachers towards their vocation have also a good deal of relevance for making teaching a respectable profession. This has also attracted sufficient degree of attention from all those who constitute employers, teacher-educators, parents and others. Teachers who detest teaching or the ones who are indifferent to it are surely not desirable. There is a need to identify them for getting them weeded out of the profession, because in a country like India where jobs are scarce even a frustrated person would like to go on doing the job he does not particularly value.

As teaching cannot be conducted in a vacuum the reaction of pupils toward their teachers also influences them considerably. Attempts are made, though unsuccessfully, to put only those teachers in the midst of students who love their jobs, are cheerful and optimistic and also have no traits of being vindictive. Indeed, the success or failure of a teacher depends largely on his possessing these traits. Efforts are, therefore, made before pre-service training is offered to prospective teachers to identify them for their positive attitudes and predicting them possible success. Of course, such efforts do not always meet with success. But tools are available in the areas of teachers' attitudes, prediction of success and efficiency in teaching, and values. After a person has joined teaching his satisfaction in the job he is holding, can also be examined.

Creativity, i.e. the identification of this factor has opened up numerous possibilities of looking at teachers and teaching under various working conditions. Still, much remains to be known. We are not sure whether teachers can be taught to be creative. We do not as yet know for certain under what circumstances does creativity flourish. It is a challenge which people have taken up in this area and testing from all possible aspects is in progress.

Despite tremendous strides man has taken in the fields of science and technology, knowledge in human behaviour, remains woefully inadequate. Not unlike other walks of life teachers are cruel, negligent of duties, socially irresponsible, depressed, and hold indifferent attitudes towards their wards, except when they exceed the normal limits of behaviour they continue to be in the job without ever getting caught. We have little or no knowledge why such teachers are not noticed early in their career. Perhaps it may be of some interest to know to what extent certain teachers deviate in their sexual behaviour and whether or not that has any bearing on his teaching efficiency.

In sum, the picture as it emerges is that the areas which are already well explored are the ones which are getting more explored. The areas of darkness are less known and there are few who venture to tread into them. We would naturally be more interested in knowing what is less or least known.

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Teacher Education, CIE, India
Education Quarterly, Ministry of Education and Social Welfare, India
Educational and Psychological Measurement, North Carolina
Educational Research Quarterly, California
Education, FDR
Genetic Psychology Monograph, USA
Educational Research, National Foundation for Educational Research in England & Wales
Journal of Creative Behavior, USA

Appendix

LIST OF TESTS AVAILABLE AT TEST LIBRARY AND TEST LABORATORY OF DEPARTMENT OF EDUCATIONAL PSYCHOLOGY AND FOUNDATIONS OF EDUCATION, NCERT

Sl. No.	*Author*	*Name of the Test*
1.	Currel and Colis	Minnesota Teacher Attitude Inventory
2.	Bowers, Henry	Aptitude Test for Elementory School Teachers in Teaching
3.	Kelley, Ida B. and Perkins, Keith J.	Purdue Teacher's Examination
4.	Shah, M. M.	Aptitude Test for Secondary School Teachers
5.	Bhattacharya, S. and Shah, M. M.	Teacher Efficiency Inventory
6.	Leo Betler, Enola Lentz, Theo F. and others	Teacher Opinionnaire on Democracy
7.	Wilson, Howard	Wilson Teachers' Appraisal Schedule
8.	Almy, H. C. and Sorenson, H.	Almy-Sorenson Rating Scale for Teachers
9.	Sister Tschechtelin, M. Amatora	The Diagnostic Teachers' Rating Scale
10.	Barr, A. S. and Harris, A. E.	Teachers' Performance Record
11.	University of Queensland	An Inventory to Mesaure Student Attitude

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Indain Educational Review Through Ten Years

A Study of Contributions and Contributors

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*A study of 19 issues of IER, published during the last ten years was undertaken to determine the distribution of contributions in terms of content areas and types of papers. Study was also made of the background of the contributors in terms of their educational qualification, their areas of specialization, institutional and provincial affiliation. The study revealed that some of the areas like Foundation Areas received greater attention in comparison to other areas like curriculum, instruction, special education and research in [illegible] areas which were generally neglected. Lecturers and Readers working in universities or research and development organizations were found to be most productive. Most of the contributors belonged to social sciences and particularly to psychology. Results indicated that most of the contributors came from Delhi. This is an evaluative study of contributions and contributors which should perhaps help in identifying the research trends, strengths, gaps and fixing priorities in the field of educational research.**

INDIAN EDUCATIONAL REVIEW, a half-yearly journal, subsequently made a quarterly journal in 1976, was first published in July 1966 by the National Council of Educational Research and Training, New Delhi, with the purpose "to provide a medium of dissemination of educational research and exchange of experience among research workers,

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*After *IER* became quarterly, we have given a definite tilt in favour of areas which were thus far not so prominent. A scheme to publish abstracts of Ph D theses has been undertaken. The present study is particularly welcome for its historical interest

—GENERAL EDITOR

scholars, teachers and others interested in educational research and related fields and professions." The editorial policy of the journal lays down that papers on or pertaining to educational research with emphasis on research problems in Indian education, will be welcome. Further, the editorial policy is to entertain the following types of material :

a. Original thinking in education or educational research.
b. Papers that make a significant contribution towards developing a theory.
c. Papers that summarise and discuss an outstanding study or piece of educational research.
d. Papers that review significant research in important areas.
e. Letters to the editor on important research problems.

The editorial preference is shown for categories *b*, *c*, *d* and *e*.

There are many ways for studying the gaps and trends in a particular area of study. Besides studying master's or doctoral theses for such a purpose, one can use the leading journals belonging to that particular field. As far as educational research is concerned, it has been observed that it is necessary to have periodic reviews of the studies of educational research in a country so that a trend of developments can be evolved which will act as a guide to future action. Such reviews in different areas help in identifying the research trends, overlaps, gaps and attempts at fixing priorities. It also helps in planning the future research. The need for studying these phenomena have provided motivation to conduct this study.

Another issue of interest which provided motivation and about which hardly any evidence is available was to study the distribution of the contributions in various content areas and about the background of those who contributed to the *Indian Educational Review* (IER).

In the light of the above, this study was undertaken with a view to answer the following questions:

1. What is the distribution of the contributions to IER in terms of content areas ?
2. What is the distribution of the papers contributed to IER in terms of: theoretical papers, research papers and review papers?
3. What is the official position of those who have contributed to IER ?
4. What is the area of specialization of those who have contributed to IER ?
5. What is the institutional affiliation of those who have contributed to IER ?
6. Which are the states to which the contributors to IER belonged?

Review of Related Research

The usual practice in determining the trends in research has been either to analyse doctoral or master level dissertations or analysing the journals in a specific field of specialization. While most of the studies attempted fall in the former category there are some studies available where leading journals have been considered as a base as well (e.g. Guilford, 1950). The studies falling in the latter category are mostly non evaluative. Some of the available studies which have attempted studying gaps, trends and background of researchers are reviewed in this section.

Derrick (1973) conducted a selective survey for reviewing the 1968, 1969 and 1970 issues of *Educational Research*, the official journal of the National Foundation for Educational Research, U.K. The review analysed some characteristics of the articles, the authors and the interrelations of these two categories. It was found that there were considerable differences in the distribution of the articles amongst the age-groups of the persons studied, the sizes of the samples, the methodologies of the designs, and the number contributed by individual British universities.

In another investigation Derrick (1974) reviewed three other journals for 1968-70 as the second stage of the project. It aimed at adding to the picture of work done in British education in the areas of Psychology and Sociology. Similar to the previous investigation (Derrick, 1973) it was found that there were considerable differences in the distribution of articles amongst the age groups of the persons studied, the sizes of the samples, the methodologies of designs, and the number contributed by individual British universities.

Morris (1973) made a content analysis of the book reviews in the *American Journal of Sociology*, *American Sociological Review* and *Social Forces* in the past twenty years to determine the patterns of the (*i*) affective nature of critiques, (*ii*) types of criticism emphasised, and (*iii*) regionality of the book reviewers. It was found that nearly 70 per cent of the reviews expressed positive attitude toward the books, less than 20 per cent were negative and remainder received no criticism. As regards the regionality of the book reviewers it was found that unlike *American Journal of Sociology* and *Social Forces* the book review contributions to the *American Sociological Review* were evenly balanced throughout the six regions with one exception. Lazarsfeld and Theilens (1958) reported in the *Academic Mind* an even more pertinent finding that the publication record of most academicians was not very significant. They found that out of 2,451 social scientists only 1,377 had published three or more papers, and that, aside from their dissertations, only 861 had published a book.

Buch (1974) in *A Survey of Research in Education* while trying to establish a trend of researches in education especially in the post-independence period has stated : In the beginning most of the studies were on philosophy of education, history of education and curriculum development. After 1950 greater interest has been shown to research problems of psychological nature. Tests and measurement has been an area with the highest number of studies—forty-two. Another area, viz. educational evaluation and examinations has contributed thirty-three studies. Personality, learning and motivation has contributed to the extent of about 11 per cent. History of education, curriculum, methods and textbooks and educational administration are other areas which have contributed fairly high. Study of pupil's achievement and its correlates has interested the researchers considerably especially after 1960 and it has contributed about 6 per cent to the total research. Philosophy of education has also been drawing continuous attention from researchers, its contribution being about 7 per cent. Teacher education, teaching and teacher behaviour and sociology of education are the areas in which concentrated research has started only recently. Buch (1974) has classified Ph. D. and non-Ph. D. research projects to indicate the trends in research. The following Table presents the results :

TABLE A

	Ph. D. studies Percentage	*Non-Ph. D Research Projects*	*Distribution of Ph D and Other Research Projects in Different Areas*
Philosophy of Education	6.7	0.0	3.8
History of Education	10.2	0.8	5.8
Sociology of Education	5.8	5.6	7.5
Personality, Learning and Motivation	10.5	2.6	8.2
Guidance and Counselling	4.7	6.3	5.8
✓Test and Measurement	12.3	7.1	11.3
Curriculum, Methods and Textbooks	10.2	12.3	9.5
Programmed Learning	1.8	4.8	2.6
Correlates of Achievement	6.4	3.7	6.0
Educational Evaluation and Examination	9.6	22.3	13.9
Teaching and Teacher Behaviour	4.1	1.5	2.9
Teacher Education	6.7	7.1	6.3
Educational Administration	9.0	7.4	7.3
Economics of Education	0.9	2.2	1.9
Social and Adult Education	1.1	4.8	2.9
Educational Surveys	—	11.5	4.3

Passi and Rama (1977) conducted a study aimed at appraising the 729 doctoral and institutional research studies in education which appeared in *A Survey of Research in Education*, against a set of six criteria, namely, the criteria of social setting, concept of education, educative process, content or subject-matter of instruction, context of enquiry and process. It was found that only one-third of the total research studies satisfied all the six criteria, while only five per cent of them satisfied none.

Glenn (1971) evaluated sixty-three issues of *American Sociologist* while Shanas (1945) made a study of the *American Journal of Sociology* through fifty years. Wispe (1969) has also reported a study of "Productivity, Size, and Turnover in a Sample of Psychology Departments".

A study of the findings reported in the investigations as reviewed above suggests that studies reported in leading journals, especially research studies can provide much useful information and worthwhile indications regarding the developing trend of educational research, representation of various regions and agencies in the research endeavour and also the background of personnel engaged in the same.

Method

Sample

Nineteen issues of *Indian Educational Review* published during the last ten years (July 1966 through July 1975) were used in the present study.

Classification of Articles

The contributions made to IER were classified on the basis of the index given in the *Encyclopaedia of Educational Research* (Ebel 1970). This index was found to be quite comprehensive and useful in comparison to other classifications given in other sources. It classifies areas of educational research in the following five content areas:

1. Foundation Areas
2. Function Areas
3. Subject Areas
4. Personnel Areas
5. Administrative Areas

Foundation Areas include topics like developmental psychology, psychology of learning, human behaviour and social foundations. Function Areas include topics like curriculum, instruction, special education, educational measurement and research. Topics like tool subjects, cultural subject and vocational subjects are covered under Subject Areas. Student personnel, teacher education and teacher personnel fall under the category of Personnel Areas. Administrative Areas include topics like levels of education, school system, school administration, educational finance and educational facilities.

The *Encyclopaedia* has further given details about topics which relate to the major topics included under various content areas.

In order to categorize contributions in the three areas, namely, research, review and theoretical, the following criteria were kept in view:

1. "Papers that summarized and discussed outstanding study or a piece of educational research" were classified as research papers.
2. "Papers that reviewed significant research in important areas" were termed as review papers.
3. "Papers that made a significant contribution towards developing a theory" were classified as theoretical papers.

Details about contributors, their official position, institutional affiliation, subject specialization, etc. were obtained from IER itself.

Results

1. *Contributions : Classification in Content Areas*

As described above, the index provided in the *Encyclopaedia of Educational Research* guided the classification of various articles in IER in various content areas. Table 1 presents the results about the distribution of these papers in various categories. The definition and topics listed under each content area have already been recorded earlier.

Table 1 indicates that there are some of the content areas where contributions have been numerous in comparison to some other areas. Most of the articles (nearly 50.24 per cent) belong to Foundation Areas, 27.75 per cent of the articles out of the total contributions belong to Function Areas. Only 6.69, 9.09 and 6.22 per cent belong to Subject Areas, Personnel Areas and Administrative Areas, respectively. The findings indicate clearly that more than half of the contributions fall in the first category, i. e. the Foundation Areas.

As far as sub-areas within each content areas are concerned, the results here are also conclusive that within the Foundation Areas most of the

TABLE 1

CLASSIFICATION OF ARTICLES IN VARIOUS CONTENT AREAS

Content Areas	*Sub areas*					*Total*
Foundation Areas	Developmental Psychology	Psychology of Learning	Human Behaviour	Social Foundations		
Number	8	41	22	34		105
Function Areas	Curriculum	Instruction	Special Education	Educational Measurement	Research	
Number	5	17	—	30	6	58
Subject Areas	Tool Subjects	Cultural Subjects	Vocational Subjects			
Number	4	6	4			14
Personnel Areas	Student Personnel	Teacher Education	Teacher Personnel			
Number	—	15	4			19
Administrative Areas	Levels of Education	School System	School Administration	Educational Finance	Educational Facilities	
Number	2	4	6	1		13

contributions have been in the area of Psychology of Learning (39.05 per cent), 32.38 per cent of the contributions within the Foundation Area relate to Social Fundations and only 20.95 per cent and 7.62 per cent of the contributions fall in the areas of Human Behaviour and Developmental Psychology, respectively.

Within the Foundation Areas, it is interesting to note that most of the contributions (nearly 51.72 per cent) fall in the category of Educational Measurement; 29.31 per cent and 10.35 per cent contributions relate to the areas of Instruction and Research, respectively, and surprisingly only 8.62 per cent contributions relate to the field of Curriculum. Studies on Curriculum, it is alarming to note, are few and isolated. Another area, namely, Special Education which is today receiving increasing attention in a number of developing countries has attracted least attention from the researchers. This is evident from the fact that not a single research study has been reported in this area.

It is found that the field of Subject Areas has generally been neglected. Within this area only six contributions relate to cultural subjects and four each to the areas of tool subjects and vocational subjects respectively.

Most of the contributions within the Personnel Areas relate to Teacher Education (N = 15) and only four contributions (21.05 per cent) out of 19 belong to the area of Teacher Personnel. The revealing finding in this case is that there is no contribution made which relates to the area of Student Personnel.

Within the Administrative Areas, only one contribution relates to Educational Finance and two to Level of Education. Most of the contributions relate to the area of School Administration and School System.

The above results pertaining to the classification of the contributions clearly indicate that certain areas within Foundation Areas have been most popular and have received most of attention. Areas and sub-areas relating to Subject Areas, Personnel Areas and Administrative Areas have been ignored.

Table 2 presents the distribution of the total contributions in IER of the last ten years, in terms of Research, Review and Theoretical Papers.

TABLE 2

CLASSIFICATION OF CONTRIBUTIONS IN TYPES OF PAPERS

Paper	*Number*	*Percentage*
Research Paper	136	65
Review Paper	31	15
Theoretical Paper	42	20
Total	209	100

This Table indicates that out of 209 contributions most of the contributions, i.e. 136 (65 per cent) are research studies. This finding is quite in tune with the editorial policy of encouraging publication of research papers since this journal is basically a research journal.

2. *Background of the Contributors*

This investigation also aimed at studying some of the background of the contributors. One of the background factors investigated was that of the official position of those who have written for IER. Table 3 presents results relating to this aspect.

TABLE 3

OFFICIAL POSITION OF THE CONTRIBUTORS

Official Position	*Number*	*Percentage*
Director	17	6.2
Dy./Astt. Director	7	2.6
Head/Prof. and Head of the Department	25	9.2
Professor	18	6.6
Registrar	1	0.4
Reader	55	20.2
Senior Research Officer	6	2.2
Principal	1	0.4
Lecturer	95	34.8
Bio-Statistician	1	0.4
Head Mistress	2	0.7
Research Assistant*	32	11.7
Teacher	2	0.7
Doctoral Student	2	0.7
Student	1	0.4
Unclassified**	12	4.4

*Category classified as Research Assistant includes Senior Research Assistant, Senior Research Fellow, Senior Research Investigator and Junior Research Fellow

**Most of the contributors did not mention their official positions

Table 3 shows that most of the contributors (35 per cent) to IER have been holding the position of a Lecturer. Next to the Lecturer are

TABLE 4

SUBJECT SPECIALIZATION OF THE CONTRIBUTORS

Subject Specialization	*Number*	*Percentage*
Education	115	42.1
Social Sciences*	126	46.1
Maths., Natural and Biological Sciences	23	8.4
Mass Communication and Training	3	1.1
Language (English)	2	0.7
Technology	1	0.4
Management	1	0.4
Agriculture	1	0.4
Unclassified	1	0.4

*This category includes Psychology, Economics, History, Social Science, Philosophy and Sociology.

Readers who have been productive in terms of contributions. Their number is 55, i.e. 20 per cent. The number of Research Assistants is 32 or 11.8 per cent, surprisingly more than the number of Professors or Heads of the Departments. There are 17 (6.2 per cent) Directors and 7 (2.6 per cent) Assistant Deputy Directors who have contributed. The total number of the contributors is 16, i.e nearly 5.9 per cent.

Data relating to the subject specialization of the contributors are given in Table 4

A perusal of Table 4 indicates that most of the contributors (126 out of 273, i.e. 46.1 per cent) work in the area of Social Sciences. To be more specific, the majority of the contributors (97 or 35.5 per cent) belong to the field of Psychology. The second place goes to Education whose number is 115 or 42.1 per cent. Those from Mathematics, Natural and Biological Sciences are only 8.4 per cent. From other fields only less than 2 per cent have contributed. The findings are obvious since the editorial policy is "to encourage publications in educational research and related fields and professions".

One of the issues of interest was to find out the institutional affiliation of those who have contributed to IER. Table 5 presents data relating to this aspect.

TABLE 5

INSTITUTIONAL AFFILIATION OF THE CONTRIBUTORS

Institution	*Number*	*Percentage*
Research/Research and Development	98	36
University, IIT and IIM	112	41.1
College	41	15
State Department of Education	6	2.2
School	5	1.9
Others*	8	2.9
Not mentioned	3	1.1

*It includes Board of Educational and Vocational Guidance, Government of India Computer Centre, Literacy House, Planning Commission, UGC and Committee on Personality and Human Development.

Table 5 indicates that maximum contributors are working in the universities. The number of such contributors is 109 and in addition three contributors are from Indian Institute of Technology and Management. On the second place are those who are working in the research and development organizations. And next are those who are in the colleges. Then come those who have been working in the schools. The results are not very surprising since most of the research work in India is done in the universities.

To which states contributors belonged was also studied and the following Table presents data relating to it

TABLE 6

STATEWISE DISTRIBUTION OF THE CONTRIBUTORS

S. No.	*State*	*Contributors Male*	*Per cent*
1.	Assam	[illegible]	[illegible]
2.	Andhra Pradesh	[illegible]	[illegible]
3.	Bihar	16	[illegible]
4.	Gujarat	[illegible]	[illegible]
5.	Haryana	[illegible]	[illegible]
6.	Himachal Pradesh	[illegible]	[illegible]
7.	Jammu & Kashmir	[illegible]	[illegible]
8.	Karnataka	[illegible]	[illegible]
9.	Kerala	[illegible]	[illegible]
10.	Madhya Pradesh	4	[illegible]
11.	Maharashtra	[illegible]	[illegible]
12.	Orissa	[illegible]	[illegible]
13.	Punjab	15	[illegible]
14.	Rajasthan	[illegible]	[illegible]
15.	Sikkim	1	[illegible]
16.	Tamil Nadu	[illegible]	[illegible]
17.	Tripura	[illegible]	[illegible]
18.	Uttar Pradesh	20	[illegible]
19.	West Bengal	4	[illegible]
20.	Chandigarh	[illegible]	[illegible]
21.	Delhi	[illegible]	[illegible]
22.	Foreigners	7	[illegible]
23.	Indians Abroad	12	4.4
	Total	[illegible]	100.00

The above Table lists those states to which contributors belonged at the time of writing for IER. As is evident most of the contributors are from Delhi (nearly 29 per cent). Almost equal number of contributors come from Gujarat and Rajasthan; 7.3 per cent of contributors hail from Uttar Pradesh; 16 (6 per cent) are from Bihar, 15 (5.5 per cent) from Punjab, 12 (4.4 per cent) from Indians living abroad and 7 (2.6 per cent) from foreigners. Rest of the states as given in Table 6 have shared less than 5 per cent contributors each.

Discussion

This study provides sufficient evidence to believe that some of the areas in Education, at least as indicated by the number of contributions in IER have received greater attention in comparison to other areas which are as important. As fashions change, interests change and consequently emphases change. People deeply want to do research not because they have "fire in the belly" but because certain areas are more tempting and rewarding. Areas like Curriculum, Instruction, Special Education and Research in Function Areas have been neglected, Personnel Areas and Administrative Areas have not received as much attention. The survey of doctoral researches in India by Buch (1974) has also shown similar phenomenon, but it is suggested that such areas should not be totally left untouched.

It is the Lecturer or Reader who has been most productive probably because it involves satisfying their professional aspiration or gaining professional recognition. Professors and those who head the Department stop writing or doing research not because they lack the ability, but under the pressure of administrative work, perhaps, they rarely find time to do much. Secondly, they lack motivation to do anything productive or to do research themselves as there are other ways of gaining 'success'. They are aware that the "professional eminence is not related to high research and conceptual ability and to strong professional commitments but to some other factors". Strauss (1966) also remarked that some of the most promising people do nothing, while others become productive even under adverse circumstances. Lecturers or Research Assistants get involved primarily because of avenues open to them and the weightage given to published work for promotion.

That most of the contributors worked in universities and research and development institutes hardly needs explanation. Most of the research in Education and Social Sciences in India is perhaps done in the universities. It is the NCERT faculty who have mostly contributed to IER. Since the purpose of this study was not to make an evaluation of the contributions, nothing can be said about the quality of papers. However, it is suggested that IER may really be made an inter-disciplinary journal with Education as a major focus, and invite papers from diverse areas which have a bearing on educational processes.

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Differential Effectiveness of Microteaching Components

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An experimental field study carried out in 1975-76 by the Department of Teacher Education, NCERT in collaboration with CASE, Baroda and nine colleges/departments of education showed that standard microteaching (or its modified form) is more effective than traditional teacher training technique in developing general teaching competence of student-teachers. A few studies were also conducted to find out the relative effectiveness of various components of microteaching such as modelling and feedback, etc. These studies are scanty and their results are not conclusive. Therefore, a comprehensive experimental study was conducted by the Department of Teacher Education in 1976-77 in collaboration with Indore University and 22 colleges/university departments of education. The main objective of the study is to find out the differential effectiveness of various components of microteaching, viz. sources of feedback, modelling procedures, simulation or real condition and change in set of skills or teaching units in developing general teaching competence. The findings of the study have direct implications for designing an effective procedure of microteaching suited to Indian conditions. A sound training strategy using microteaching as a powerful supplement to existing student-teaching programme can be worked out on the basis of the findings of this study.

M[illegible] indicate that microteaching is an effective technique in the modification of teacher behaviour. Some [illegible] technique of training than [illegible] found that teachers became more [illegible] when trained through microteaching. [illegible] teaching is a better technique than the conventional method [illegible] indirect teacher behaviour. According to the findings of [illegible] (1972), microteaching was a better [illegible] in the development of certain teaching skills [illegible] silence and non-verbal cues.

Microteaching is an effective technique [illegible] the skill of questioning (Passi and Shah 1974, [illegible]) [illegible] ment and silence and non-verbal cues ([illegible]). Similar results have been obtained by [illegible] technic teachers. It is a more effective technique [illegible] approach to teacher training [illegible] of teacher behaviour (Singh 1974). Some more [illegible] undertaken at CASE, Baroda (Joshi [illegible], [illegible] Sharma 1976, Vaze 1974) [illegible] technique as compared to the conventional approach to the development of teaching skills.

Thus the results of research studies [illegible] aging as regards the applicability of microteaching [illegible] However, such studies were sporadic and [illegible] at wider generalizations. Therefore, a large-scale experimental field study was undertaken in 1975-76 by the Department of Teacher Education, NCERT in collaboration with CASE, Baroda, and nine [illegible] departments of education. The main finding of the study is that the student-teachers trained through microteaching or modified microteaching technique acquire higher teaching competence than traditional teacher training technique or the usual practice teaching programme (Das, et al 1976). Under this project, a number of research studies were designed and carried out in these institutions from all over India.

In addition to study the effectiveness of microteaching as a teacher training technique, some studies have been carried out to find out the relative effectiveness of its various components such as modelling (supervisor, peer or audio), and feedback, etc. According to the findings of [illegible] field experiment, all the four studies found no significant differences between the feedback provided by supervisor and the feedback given by peer supervisor in the scores on general teaching competence (Das, *et al*. 1976). Sharma (1976), in his doctoral research, has found that audiotape and supervisor feedback is more effective than peer feedback in the development of general teaching competence. Some studies tried to compare the relative effectiveness of perceptual and symbolic modelling. Vaze (1974) in his doctoral study found that symbolic modelling was a better technique than audio modelling in developing the skill of probing questions. Two studies of NCERT field experiment (1975-76) found no significant differences in perceptual and symbolic modelling (Das, *et al* 1976).

The effectiveness of microteaching if practised under simulated or real classroom condition is a disputing concept. According to Allen and Ryan (1969) microteaching is real teaching but the complexities of normal classroom teaching are lessened. According to Passi and Lalitha (1977), microteaching is not completely a real teaching situation. It is real to the extent that teaching and learning are going on. The teaching process is governed by the principle of maximizing the use of particular teaching skills. Although learning on the part of the pupils is no less important, the main focus in microteaching is to train teacher-trainees in specific teaching skills. The content being taught by the trainees is of secondary importance whereas maximizing the use of the teaching skill is of primary focus. Maximization of the use of skill may depend upon many other factors. Some such factors are : the set of skill in which training is being provided, the sequencing of skills in a set : the content of unit under the same subject. Little or no research has been done to assess the relative effectiveness of these aspects of microteaching in India.

Thus, the studies of microteaching components are either scanty and sporadic or their results are not conclusive. Hence, there is a need to undertake studies at national level which are rather comprehensive and systematic in finding out the relative effectiveness of various components of microteaching such as sources of feedback, variations in modelling simulation or real conditions, and change in set of skills and teaching units. To fulfil this need the present study was undertaken.

Statement of the Problem

The problem may be stated as 'A Study of Differential Effectiveness of Various Components of Microteaching Technique in the Development of General Teaching Competence of Student Teachers in Secondary Teacher Education Institutions'.

Definition of Terms

1. *Standard Microteaching Technique* (SMT)

According to the standard procedure of microteaching technique, student-teachers are trained in using perceptual modelling demonstrated by college supervisor (s) and immediate feedback is given by the peer supervisor (s). The MT cycle is consisted of teach-feedback-replan-reteach-refeedback and training is given under simulated conditions among peers as pupils. Each student-teacher gives two micro lessons on each of the five skills in a given sequence.

2. *Modified Microteaching Technique* (MMT)

All the conditions of SMT remain exactly the same except planned variation in any of the aspects of microteaching : modelling, feedback, condition, set of skills, teaching units, and setting, i.e. number of pupils, duration of micro lesson, etc.

3. *General Teaching Competence* (GTC)

The teaching competence of student-teachers as assessed by the Baroda General Teaching Competence (BGTC) Schedule developed on the lines of Stanford Teaching Competence Appraisal Guide (STCAG).

Objectives

The specific objectives of the study are :

1. To compare the effectiveness of different modelling (perceptual, symbolic and audio) procedures with respect to general teaching competence of student-teachers.
2. To study the varying sources of feedback (supervisor, peer, audio-tape) in improving the general teaching competence.
3. To study the effect of immediate and delayed feedback upon general teaching competence.
4. To study the effectiveness of microteaching under simulation and real classroom situation with respect of general teaching competence.
5. To study the differences in the attainment of general teaching competence of student-teachers due to change in set of skills or teaching units.
6. To compare the 'cumulative effect' of training through microteaching with varying components followed by teaching of five regular lessons on general teaching competence of student-teachers.

Hypotheses

The following null hypotheses are formulated :

1. There is no significant difference in GTC scores of student-teachers trained through microteaching with different modelling (symbolic, perceptual and audio) procedures.
2. There is no significant difference in GTC scores of student-teachers trained through microteaching with different modes of feedback (supervisor, peer, audiotape).
3. There is no significant difference in GTC scores of student-teachers trained through microteaching under simulation or real classroom situation.
4. There is no significant difference in GTC scores of student-teachers trained through microteaching when set of skills or teaching unit is changed.
5. There is no significant change in the cumulative effect of training through microteaching technique (with changes in its components) followed by teaching of five regular lessons on general teaching competence scores of student-teachers.

Scope of the Study

The study was confined to the student-teachers of one-year degree course in education offered by the colleges/university departments of education in the country. Both men and women student-teachers were taken as the subjects. Further, the study was not confined to any specific characteristic background of student-teachers such as qualifications, experience, socio-economic status and religious affiliations, etc.

Method and Procedure

A test of similar experimental designs was undertaken simultaneously by 22 teacher education institutions from different parts of the country. All the institutions followed parallel group experimental design. The collaborating teacher-educators representing these institutions were given intensive training in the microteaching technique in a ten-day seminar held at CASE, Baroda, in August 1976. They were helped in planning and designing sub-projects which they carried out in their respective institutions during 1976-77 as part of a national project designed and sponsored by the Department of Teacher Education, NCERT. The treatments were standardized and kept uniform for the control group which was termed as the Standard Microteaching Technique [illegible] ations in the components of [illegible] in the experimental group which was termed as the Modified Microteaching Technique (MMT) group. The [illegible] criterion measures, the control [illegible] tant for all the treatment groups and [illegible]

Sample

Out of 40 colleges of education [illegible] who deputed one teacher-educator each [illegible] Seminar on Planning Research in Microteaching held [illegible] August 1976, only 22 institutions could [illegible] tion of 29 researchers. Of these, [illegible] ten from the western, five from the [illegible] regions of the country. These institutions [illegible] universities and one State Department of Education.

In all, 444 student-teachers [illegible] 424 subjects were B.Ed. students and 20 [illegible] graduate course in teacher education. [illegible] and 46 per cent were female. According to the age [illegible] cent and belonged to ages between 18-25 years [illegible] above 30 years of age.

Except six subjects who were having undergraduate [illegible] the other (75 per cent) subjects were graduates and 25 per cent [illegible] graduates. The control group consisted of [illegible] per cent postgraduates while the experimental group had [illegible] graduates and 75.3 per cent postgraduates. There [illegible] subjects in the experimental group.

Treatment

A common procedure was followed by the participating institutions while conducting the experimental studies. After the sample of each sub-study was selected, it was randomly distributed into two equal groups. One of the groups was trained through Standard Microteaching Technique (SMT) and the other through Modified Microteaching Technique (MMT).

Each of the participating institutions tried one variation in one component of the microteaching which formed the MMT treatment for that institution. The various MMT treatments and the corresponding institutions are shown in Table 1.

TABLE 1

INSTITUTIONS AND THEIR RESPECTIVE MMT TREATMENT

S. No.	MMT Treatment	Code Number of the Institutions	Total
1	Modelling Symbolic	01, 02, 03	3
2	Modelling Audio	04, 05, 06	3
3	Feedback Supervisor	07, 08, 09, 10, 11, 12	6
4	Feedback Audiotape	13	1
5	Condition Real	14, 15, 16, 17, 18	5
6	Condition Mixed	19	1
7	Different set of Skills	20, 21	2
8	Change in [illegible]	22	1

The Design

After the two groups (SMT and MMT) were formed, the following tools were administered to both the groups:

1. Ahluwalia's Teacher Attitude Inventory (ATAI)
2. Cattell's Culture Fair Intelligence Test.

These tools were supplied by the Department of Teacher Education, NCERT.

All the student-teachers in the two groups gave two traditional type lessons of full length period in actual classroom setting. Their teaching was observed and performance was rated on Baroda General Teaching Competence (BGTC) Schedule. The rating was done by the investigators with or without another college supervisor. The mean performance on the two lessons formed the pretest scores.

The student-teachers were then subjected to respective treatments as discussed earlier. Each student-teacher in both the SMT and MMT groups, gave two micro-lessons on each skill. Five skills, namely, probing questioning, stimulus variation, reinforcement, explaining and illustrating with examples were chosen for the micro-lessons. Thus in all, ten micro-lessons were given by each student-teacher. However, the student-teachers of MMT groups of institutions (Nos. 20 and 21), a different set of skills was taken as the experimental treatment. These skills were: probing questioning, reinforcement, attending behaviour, black-board skill and illustrating with examples.

After ten micro-lessons, all the trainees in both the groups were again observed on BGTC schedule while teaching two regular lessons in the school by the same supervisor (s). The mean performance on the two lessons formed the post-test scores

The normal practice teaching then continued for both the groups under regular school conditions. After they taught five macro lessons, they were again observed on the BGTC schedule for two regular lessons, each of 40 minutes duration, by the same supervisor (s). At this stage Ahluwalia's Teacher Attitude Inventory was also administered on all the student teachers. The mean performance on two lessons on BGTC schedule and attitude scores formed the post-test II measures

The overall design of the experiment can be represented below.

SCHEMATIC PRESENTATION OF THE EXPERIMENTAL DESIGN

1. Subjects	Control Group N - 209	Experimental Group N - 315 Time 15 wks
2. Pretest measure on two macro-lessons	ATAI BGTC CCFIT	ATAI BGTC CCFIT
3. Treatments Ten microlessons, two for each of the five skills i) Probing questions ii) Stimulus Variation iii) Reinforcement iv) Explaining v) Illustrating with Examples	SMT Treatment	One of the following MMT treatments i) Modelling Symbolic Audio ii) Feedback Supervisor Peers Audiotape iii) Condition Real class room iv) Set of skills Different than SMT v) Change in time during reteach session Ten micro lessons as in SMT
4. Post-test—I measure on two macro-lessons	BGTC	BGTC
5. Practice Teaching	5 lessons under normal school condition	5 lessons under normal school condition
6. Post-test—II measure on macro-lessons	BGTC ATAI	BGTC ATAI

Tools

The following tools were used for collection of the relevant data for the study.

(a) Ahluwalia's Teacher Attitude Inventory

The attitude inventory, developed by Ahluwalia (1974), consists of 90 items distributed over six sub-scales constructed on the lines of Likert Summated Rating procedure. Each scale has 15 statements related to a particular aspect of prospective and practising teachers' professional attitudes. The six aspects included in the inventory are: (i) Teaching Profession, (ii) Classroom Teaching, (iii) Child-Centred Practices, (*iv*) Educational Process, (*v*) Pupils, and (*vi*) Teachers. The responses are to be given on a five-point scale. The split-half reliability is found to be 0.79 (N=239). The test-retest reliability after intervals of 3 months and 9 months are found to be 0.59 (N=102) and 0.64 (N=290). The inventory has a satisfactory content validity. The statewise and areawise norms for the five Hindi-speaking states are available.

(b) Cattell's Culture Fair Intelligence Test (Scale 3 Form B)

Cattell's Culture Fair Intelligence Test (Scale 3 Form B) was used to measure the basic mental capacity for the general intelligence of student-teachers. The test consists of 50 items distributed over four sub-tests. The reliability of the test ranges from 0.71 to 0.94. The test has a good content validity (r=0.85).

(c) Baroda General Teaching Competence (BGTC)

This tool was used to get the criterion measure on general teaching competence of the subjects. It is an observation schedule to measure general teaching competence through rating procedure. It was developed at the Centre of Advanced Study in Education, Baroda. It has 21 items related to planning, presentation, evaluation and classroom management to be rated on a seven-point scale.

(d) Evaluation Proformas for Teaching Skills

For observing the five teaching skills, namely, skills of probing questioning, stimulus variation, explaining, reinforcement and illustrating with examples two types of evaluation proformas (frequency type and rating type) were used. All these proformas have been developed by Passi, *et al.* (1976). Each of these proformas have items related to the various components of the corresponding teaching skills. The frequency type proformas were used during the micro-lessons, whereas the rating type were used at the end of the lessons. In the present study both the types of proformas were used for the purposes of giving feedback only.

Analysis

The raw scores were converted into the following gain scores.

G_1 = Gain scores between Post-test-I and Pre-test indicating the difference in GTC scores due to the treatment variable

G_2 : Gain score between Post-test-II and Pre-test showing cumulative effect of microteaching treatment and the usual practice teaching following the treatment in terms of GTC scores.

Effect of each of the treatment variables on the G_1 and G_2 scores was studied after partialling out the effect of intelligence and attitude scores.

Results and Discussion

Table 2 includes the summary of ANOVA results for the scores of attitude towards teaching and intelligence for SMT and MMT groups. This analysis was done with a view to see the comparability of SMT and MMT groups for the covariates of attitudes towards teaching and intelligence of student-teachers. The F-values of 0.065 for df 1,422 for the criterion scores for the attitudes towards teaching is not significant. Similarly, the F-value of 0.237 for df 1,422 is not significant for the criterion scores of intelligence. Both these results indicate that SMT and MMT groups are comparable for the variables of attitude towards teaching and intelligence.

Nevertheless, for final discrimination the analysis of covariance was carried on in the subsequent analysis.

TABLE 2

SIGNIFICANCE OF DIFFERENCE BETWEEN THE MEANS OF SMT AND MMT GROUPS ON ATTITUDE TOWARDS TEACHING AND INTELLIGENCE

Variable	*Source*	*Degrees of Freedom*	*Sum of Squares*	*Mean Sum of Squares*	*F*	*p*
Attitude Towards Teaching	Between	1	147.0	147.0	0.065	[illegible]
	Within	422	94544.3	[illegible]		NS
	Total	423	94,691.4			
Intelligence	Between	1	723.3	723.3	.237	[illegible]
	Within	422	1289703.0	3056.2		NS
	Total	423	1290426.3			

NS—Not significant

Table 3 presents the results for gain scores G_1 (post-test-I pre-test) for the students belonging to the groups having SMT and MMT treatments. The criterion scores of G_1 have been adjusted for both the covariates of attitude and intelligence. Table 3 presents the results related to the five types of experiments : *(i)* variation in modelling, *(ii)* variation in feedback, *(iii)* variation in condition, *(iv)* variation in set of skills, and *(v)* variation in teaching units. The results of the studies related to modelling have shown that the F-value is almost zero for df 1/118. This means that the variation in modelling, i.e. symbolic modelling and perceptual modelling, has produced equal effects on the gain scores of G_1 when the adjustments were made for the initial differences in attitude and intelligence.

The F-value related to the dimension of feedback happens to be 0.79 for degrees of freedom 1/101. This value is not significant. The variation in feedback, i.e. peer vs supervisor and peer vs audio, has produced equal effects on the gain scores G_1 when adjustments were made for the initial difference in attitude and intelligence.

The F-value for the dimension of conditions happens to be 0.16 for df 1/134. This value is not significant. This means that variation in conditions, i.e. simulated, real, and mixed has produced equal effects on the gain scores G_1 when adjustments were made for the initial differences in attitude and intelligence.

The F-value for the dimension of set of skills happens to be 0.12 for df 1/36. This value is not significant. This means that variation in set of skills, i.e. the first set of skills and second set of skills has produced equal effects on the gain scores G_1 when adjustments were made for the initial differences in attitude and intelligence.

The F-value for the change of teaching unit during 'reteach' happens to be 0.03 for df 1/14 which is not significant. This means that variation in teaching unit, i.e. reteach with the same unit and reteach with the different unit has produced equal effects on the gain scores G_1 when adjustments were made for the initial differences in attitude and intelligence.

TABLE 3

RESULTS OF THE ANALYSIS OF COVARIANCE HAVING G_1 ON OTC SCORES AS THE CRITERION AND ATTITUDE AND INTELLIGENCE AS THE COVARIATES

Aspect of Micro teaching	*Sources of Variation*	*Degrees of Freedom*	*Sum of Squares*	*Mean S.S.*	*F-Value*
(a) Modelling	Between	1	1.79	1.79	0.00 NS
	Within	118	47454.80	402.15	
	Total	119	47456.59		
(b) Feedback	Between	1	216.62	216.62	.79 NS
	Within	101	27575.55	271.02	
	Total	102	27590.17		

(c) Condition	Between	1	[illegible]	[illegible]	[illegible]
	Within	114	[illegible]	[illegible]	
	Total	115	[illegible]		
(d) Set of Skills	Between	1	[illegible]	[illegible]	[illegible]
	Within	[illegible]	[illegible]	[illegible]	
	Total	[illegible]	[illegible]		
(e) Teaching Unit	Between	1	[illegible]	[illegible]	[illegible]
	Within	14	[illegible]	[illegible]	
	Total	15	621.92		
(f) All the aspects together	Between	1	[illegible]	[illegible]	[illegible]
	Within	419	[illegible]	[illegible]	
	Total	420	[illegible]		

Table 4 includes the results for gain scores G_2 (post-test-II pre-test) for the students belonging to the groups having SMT and MMT treatments. The criterion score of G_2 have been adjusted for both the covariates of attitude and intelligence. Table 4 presents the results related to the five types of experiments: *(i)* variation in modelling, *(ii)* variation in feedback, *(iii)* variation in condition, *(iv)* variation in set of skills, and *(v)* variation in teaching units. The results of the studies related to modelling have shown that the F-value is 0.14 for df 1/79. This value is not significant. This means that the variation in modelling, i.e. symbolic modelling and perceptual modelling has produced equal effects on the gain scores of G_2 when the adjustments were made for the initial differences in attitude and intelligence.

The F-value related to the dimension of feedback happens to be 0.53 for df 1/62 which is not significant. The variation in feedback, i.e. peer *vs.* supervisor and peer *vs.* audio has produced equal effects on the gain scores G_2 when adjustments were made for the initial differences in attitude and intelligence.

The F-value for the dimension of condition happens to be 0.44 for df 1/114 which is not significant. This means that variation in condition, i.e. simulated, real and mixed has produced equal effects on the gain scores G_2 when adjustments were made for the initial differences in attitude and intelligence.

The F-value for the dimension of set of skills happens to be 1.29 for df 1/36. This value is not significant. This means that the variation in set of skills, i.e. the first set of skills and second set of skills has produced equal effects on the gain scores G_2 when adjustment were made for the initial differences in attitude and intelligence.

The F-value for the dimension of teaching unit happens to be 0.01 for df. 1 14 which is not significant. This means that the variation in teaching unit, i e reteach with the same unit and reteach with the different unit has produced equal effects on the gain scores G_g when adjustments were made for the initial differences in attitude and intelligence.

TABLE 4

RESULTS OF THE ANALYSIS OF COVARIANCE HAVING G_g ON GTC SCORES AS THE CRITERION AND ATTITUDE AND INTELLIGENCE AS THE COVARIATES

Aspect of M T	*Sources of Variation*	*Degrees of Freedom*	*Sum of Squares*	*Mean S S.*	*F-Value*
Modelling	Between	1	24.97	24.97	.14 NS
	Within	79	13954.85	176.64	
	Total	80	13979.82		
Feedback	Between	1	128.84	128.84	.53 NS
	Within	62	14881.36	240.02	
	Total	63	15010.20		
Condition	Between	1	136.86	136.86	.44 NS
	Within	114	35267.57	309.36	
	Total	115	35404.43		
Set of Skills	Between	1	194.47	194.47	1.29 NS
	Within	36	5404.71	150.13	
	Total	37	5599.18		
Change of Unit	Between	1	.64	.64	.01 NS
	Within	14	812.38	58.02	
	Total	15	813.02		
All the aspects together	Between	1	8.92	8.92	.02 NS
	Within	320	102270.44	319.59	
	Total	321	102279.36		

Conclusions

The following general conclusions may be drawn from the results of this study.

1. General teaching competence of student-teachers trained through microteaching with perceptual modelling does not differ with those trained under microteaching with either symbolic or audio modelling.

2. GTC scores of student-teachers do not differ significantly when trained through microteaching with various sources of feedback. In other words, the feedback given by peers or college supervisors or self-feedback by audiotape have similar effects on development of general teaching competence.
3. Microteaching under simulated conditions and under real classroom conditions do not produce different effects on development of general teaching competence.
4. The change in the nature of component skills in a set does not have differential effects on the teaching competence of student-teachers when trained through microteaching.
5. Development of general teaching competence is not affected significantly if the same or different teaching unit is taught in the 'reteach' session of microteaching.
6. Planned variations in the microteaching components such as modelling, feedback, conditions, etc. do not produce significant changes in gain scores reflecting the cumulative effect on general teaching competence of student-teachers when training in microteaching is followed for some period by usual practice teaching.

Implications

Microteaching is a recent innovative technique for training teachers, particularly in India. It has been introduced in some institutions for the last few years as part of their regular practice teaching programme. During the last two years about 30 secondary teachers' education institutions have tried this technique as part of a research project. It has been immensely felt that a sound training strategy should be worked out which is based on the available research findings. The results of this field experiment, therefore, have direct relevance to this need. The findings will prove useful in effecting microteaching as a powerful supplement to the existing student teaching programme.

The NCERT Microteaching Project carried out during 1975-76 provided ample proof in support of microteaching as an effective technique of developing specific teaching skills and general teaching competence in student-teachers. The present experiment involving 22 sub-studies has provided with research findings related to various components of microteaching and their important variations. Therefore, large-scale orientation programmes for teacher-educators will have to be organized to train them in the microteaching technique and to help them plan and carry out more effective student teaching programme using microteaching as a supplementary device.

For wider adoption of microteaching techniques as an integral part of normal student teaching programme, the B.Ed. curriculum, particularly the student teaching and its evaluation, may be revised. Objectives should be restated in terms of teaching skills and specific teacher behaviours.

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A Structural Framework for Multidisciplinary Studies

Application of Some Interaction Models to Multidisciplinary Transactions

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More than a decade ago C. P. Snow argued that Western society had become seriously fragmented in that men educated in different disciplines rarely had any meaningful communication. This realization of the compartmentalization of knowledge and skills has been experienced by persons concerned about education from the time of ancient Greece to the modern era. Incidental methods of interrelating aspects of one discipline to mainly one another or perhaps to a few others have been attempted. But a wider, consistent concept of the multidisciplinary approach involving all relevant disciplines has not been developed. This is largely due to the lack of a structural framework within which it could be possible to accommodate the disciplines to be related without raising the objections usually expressed by critics that relating subjects to each other means that any one subject will be subordinated in the process.

Need for an Unifying Structure for Multidisciplinary Studies

The purpose of this paper is to apply certain "interaction" models drawn from different disciplines to multidisciplinary transactions. The study of the development of the individual does not belong to any one discipline. The complexity of the many problems and issues involved in human behaviour makes its study multidisciplinary. At the same time, the individual being the point of intersection, the functioning unit, serious attempts have been made to relate the different contributions of the different disciplines to arrive at an unified theory of human behaviour (Grinker 1959). The attempts have not been completely successful, but some of the models developed prove to be appropriate for application in other similar situations. An attempt is made here to explore the possibilities of drawing up a structural framework for multidisciplinary transactions, through the application of a few interaction models as has been attempted with reference to human behaviour.

Multidisciplinary Transactions

The term 'multidisciplinary transactions' is defined in this paper as the transactions among all disciplines viewed as an on-going process which accommodates a multidimensional pattern of events into the space-time axes. This definition is based on terms used by Thompson (1959) to describe "the societal system." Each discipline is viewed as a system within which are differentiated many small sub-systems that are in constant movement and in interaction with each other. These interactions are visualized as going on within the systems, i.e. disciplines, when the disciplines interact among themselves also. The second type of interaction, therefore, requires another term which subsumes the first type of interaction. Theorists have used the term "transactions" for this interaction. It would mean the process of interaction that takes place among systems, which are simultaneously experiencing interactions within sub-systems, at a period in time and place in space.

To make any statements about transactions among systems, as disciplines are viewed, models are required to provide a structural framework. A few interaction models are outlined here, and their weaknesses, both experienced and envisaged, are discussed. If it is possible to accept them either alone or in combination, to draw up a structural framework for multidisciplinary transactions, the model/s could contribute to the building up of common abstractions within one system of denotation.

Linear Hierarchy Model

A simple way of arranging data is provided by this model. The disciplines to be related are envisaged as stacked one above the other in a ladder-like structure, with discipline A* ascribed a position either at the top or at the bottom, and the other disciplines ordered on a system of relatedness. Spiegel (1959) has demonstrated this model which he terms also as container-can, Chinese box or telescopic, where he is able to introduce a developmental component, through which everything at lower level** is contained in higher and higher, larger and larger assembly units. In multidisciplinary transactions instead of widening there is the possibility of weakening of relationships and a gradual change from directness to indirectness. When a concept like peer group is taken up for study with sociology as discipline A, it would first be related to psychology/education and so on till the relationship is no longer clear.

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*The discipline which is being studied in a multidisciplinary context is termed as discipline A.

The weaknesses in such a model are several. The concept of hierarchy is inbuilt and it will be difficult to ascribe levels to the different disciplines. There is no provision for bringing out the transactions happening among the desciplines, when describing those discipline A and one other discipline at a time. Into this linear hierarchic model it is therefore difficult to bring in the idea of movement, which is basic to multidisciplinary transactions.

Core-Periphery Model

This is only a variation of the linear hierarchic model with the differences in hierarchy represented on the same plane as different radii, and discipline A forming the core. But inherent in this model is the concept of encirclement of forming a whole and the possibility of widening of boundaries to accommodate for changes and growth in the different disciplines. To this extent it has grater movement than the linear model.

Circular System of Transactions

The lim tations pointed out in the linear model are overcome to some extent in the circular system of transactions described by Grinker (1959), in his attempt to provide for an unified theory of human behaviour. When this system is applied to multidisciplinary transactions we assume the particular discipline A to be represented as a circular disc which is transacting with all other disciplines which together form an environment, and which is also represented as a circular disc. If the diameters are equal the two discs would be superimposed on each other. This situation depends on the possibilities of discipline A Otherwise the circle of discipline A will be smaller in diameter. The two discs are expected to be in continuous movement. Within the two discs Grinker differentiates "many small systems which will remain under the potential dominance of the whole, but which

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**Higher and lower are positions of convenience and are related to habits of thought. They do not indicate hierarchy.

are linked with each other in a circular process of transactions" (Grinker, 1959 a, p. 11). This description approximates Parsons' (1951) description of wheels within wheels. It would then be possible to state that paired wheels would provide meaningful data for comparison at a certain period of time. It is also shown that movement of each sub-system depends on the movement of others. Here when we study peer groups in sociology as discipline A we would compare it with common concepts in other disciplines in turn, as the disc in its movement brings them together. At the next coming together of the paired wheels both could have undergone changes.

The circular system model is based on constant movement and brings in the concept of transactions as happening always. Although Grinker does not postulate any differences in positions, Spiegel (1956) has pointed out that Grinker does use the term 'level' and hence the concept of hierarchy is brought in. The movements visualized are less regular, definite and circumscribed and would mean limited transactions and therefore less growth.

Basic Modules Structure

This module for interdisciplinary studies has already been applied in the study of environmental sciences. It is based on the identification of basic concepts of one discipline which have relevance and also could be basic to other disciplines. It would then be possible to reach a level of verbal abstraction, incorporating aspects that are common to the different disciplines, which could result in a number of modules. These modules, like building blocks of various sizes can be combined to build a multidimensional structure. The modules can be widened or narrowed and the structure taken apart and rebuilt, thereby providing for growth and movement. To continue the example of peer group, it would be module in itself which could be linked to other socializing agencies that are modules and then on to secondary groups and so on.

The weaknesses envisaged here are the difficulty of arriving at valid concepts as the same terms when applied to different disciplines would exhibit semantic differences in relation to form and function : (*i*) Consensus as to what is basic in each subject cannot be reached easily in the less exact sciences particularly, and (*ii*) the model though functional in itself would have left out chunks of material in each discipline whose importance cannot be denied and whose relevance may not be immediately evident.

Osmosis Model

This model is drawn from language study and when applied to multidisciplinary transactions would expect us to see all the disciplines at existing in an environment and functioning under their own laws and principles and taking from each other whatever aspects can be imbibed. Borrowing and lending, as Manuel describes, would happen freely, and would take place through unconscious assimilation and permeation. While this model explains the process of transaction it does not provide a stable structural framework as a laissez-faire situation cannot have definiteness.

Frame of Reference and Cross Classification Grid

Parsons (1959) has formulated the unifying component in systems transactions as "frame of reference" (which again he calls as *action). He disagrees with the hierarchic ordering of systems,* and accepts that it is not interaction which takes place between disciplines but transactions. This term "frame of reference" is different from the meaning "in context" with which meaning the term is usually accepted. Here it is wider, active not passive and includes simultaneously process-product dimensions. The disciplines can be considered as forming the boundaries of a cross classification model, a grid, similar to the intercorrelation matrix in statistics. This grid can be placed over the discipline or aspect of the discipline to be studied and conclusions arrived. The linear model is included within this as one dimension and if the module is taken as the unit of study, the frame of reference model would attain definiteness. However, when applying the model it is very often felt that the grid is a technique rather than a model.

Field Systems

A variation of Lewin's psychological field is presented here. The disciplines are visualized as system, constantly transaction within themselves and with other systems outside. The specific organism/environment distinction is absent till observation is started at one point in time or space To use the example given by Spiegel (1959) when the personality system of an individual is observed then everything else becomes environment—the physical, social or cultural systems. They become peripheral or on the boundary as far as the system under study is concerned, "radiating in or out like lines of force". To continue to use Spiegel's (1959) terms there will be discrimination between "focus", what is happening at *that period of time and "foci", which make up the surrounding field. Once* the "focus" is changed, the point of observation is moved, the whole field is readjusted to repeat the process. Spiegel (1959) points out one limitation. He says that if such a structural model is visualized there is no way of describing interactions except those taking place between the point of focus and the 'local' field and would neglect the interactions taking place in the extended field at the same time.

If within the field we are willing to accept the existence of the circular system of transactions as described by Grinker, then the transactions taking place would not be confined to the local field. Again, if the whole field is viewed as the 'frame of reference' postulated by Parsons then all the transactions, i.e. the 'foci' have a meaningful relation to each other and to 'focus'. The osmosis model would become a technique and the module a product of multidisciplinary transactions in this situation.

The field system accommodates the inward-outward space dimension and the forward-backward time dimension required for the multidimensional characteristic of multidisciplinary transactions as defined earlier in a paper.

Applications of the Models

The acceptance of any model as the basis for the structural approach for multidisciplinary studies would be useful in :

1. Guiding deliberations on multidisciplinary studies.
2. Framing multidisciplinary concepts for study and application.
3. Applying the multidisciplinary approach in drawing up the syllabus for any discipline.
4. Providing the curriculum for training in any specific occupation that requires multifaceted skills.
5. Carrying out multidisciplinary research.
6. Providing a balanced relationship among disciplines and thereby providing for a wider outlook among the different discipline experts. This in turn would help in fostering a healthy respect for all disciplines and in the acceptance of the usefulness of all disciplines both as individual disciplines and as contributing ones.

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Abstracts of Ph.D. Theses

The Role of School Libraries in Primary and Secondary Schools

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THE INQUISITIVENESS is a characteristic of [illegible] present right from the childhood and it persists throughout the life of a person. The library can be cited as one of the example to satisfy the thirst for knowledge and also inquisitiveness. The library can also be called as the treasure of knowledge. The educationists of the world have laid a great emphasis on the role of library and its need in the development of students. Unfortunately, the fate of our school libraries is far from satisfactory. This [illegible] led the author to go deep into this problem and study the [illegible] of the libraries in primary and secondary schools of Bombay and also of the State of Maharashtra.

In order to give a scientific approach, the investigator adopted the [illegible]tive method. The investigator prepared two questionnaires, one for the principal and another for the librarian of the school. The second questionnaire was prepared for collecting the following information:

1. Physical condition of the library room
2. Physical condition of the stack-room
3. Physical condition of the reading-room
4. Classification and cataloguing
5. Motivation
6. Library budget
7. Audio-visual aids

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* Thesis submitted to Bombay University (1975)

** The publication of abstracts of Ph.D. theses is financed by the Indian Council for Social Science Research, New Delhi

MAIN FINDINGS

The questionnaires were sent to 350 schools of interior Maharashtra. Out of which the response was received from only 52 schools. This response reflects on the indifferent attitude on the part of the school personnel which is the main handicap for the progress of research in our country. As regards the response in the proper Bombay, out of 150 schools, the response was received from 110 schools. This response was received because the investigator personally visited several times these schools.

SEPARATE LIBRARY ROOM

Out of the total number of responses, one-third of the total number of schools had no separate library rooms in the city of Bombay. Similar condition prevailed in school libraries in the interior of Maharashtra. At primary school level, separate school library did not exist at all.

Out of the total secondary schools of Bombay studied, one-fourth of them had a separate library room which was converted from the classroom. The main reason is the acute accommodation problem of the city. Only a few schools had specially constructed library room. The findings regarding library facilities can be summarized under three different headings, viz English, Marathi and Gujarati-medium secondary schools.

1. It was found during the survey that in spite of having spacious school buildings with various facilities, library rooms were not given due importance in most of the English-medium secondary schools.
2. As against this, it was found that although 23 schools had full-fledged library facilities, even then the authorities had tried their best to develop school library. In all such schools the main library room was used in a multipurpose way, viz. principal's room, staff room, etc. Some schools had enough accommodation in the reading room but due to insufficient furniture and unqualified staff, only SSC students and staff members were allowed to visit the library. Most of the other schools had class library system. Under this system boxes of library books were distributed in respective classes in the beginning of the academic year. In case of special demands for books from any class, they were provided from the general stack-room.
3. The study of Gujarati-medium secondary schools led to three main conclusions :

(*i*) While considering their accommodation problem, books were kept in corridors, office rooms, or in the staff rooms. In certain schools, in order to solve this problem, they had adopted the class library system. In the class library system a quota of books are allotted to different classes in the beginning of the academic year.

(*ii*) The second type of the schools was wherein the accommodation was not a great problem and still no efforts were made by the authority in the development of a good library. The library was placed in a small corner, or books were arranged in cupboards and kept in galleries along with the walls. This shows the negligence of the school authority towards the library.

(*iii*) It was also felt that in spite of many problems, the principals of the schools were keen on developing a school library.

An exception to these findings: only few schools had a full-fledged school library with all necessary facilities.

The primary school library with all types had not gained any importance. A few schools had libraries, but out of the few schools, some got their books from the parent donors and, therefore, their stock did not fully cater to the needs of the same age-group of students.

While considering the municipality schools, they had enough books but due to the constant fear of getting books lost, the authority kept the entire stock as a show-piece in their cupboards. The main reason for such action was that a teacher was held responsible for the loss or damage of the books. Hence, the students were the sufferers because they were deprived of their right to read library books.

SCHOOL LIBRARIES IN INTERIOR MAHARASHTRA

The survey of the school libraries in interior Maharashtra was done through correspondence and so no information could be gathered about the local situation of the school libraries. It was found from the collected data that the condition of school libraries was very disappointing. Out of all the schools only one school is worth mentioning. This institution had an educational complex comprising of schools and colleges in surrounding areas and there was a common library for all these educational centres. They had a full-time qualified librarian, well-equipped library with useful magazines, journals and audio-visual aids.

PER HEAD FLOOR AREA

Since the size of the library room was small and there was a constantly increasing inflow of more and more number of students, every year in every class, the per head floor area in secondary schools of Bombay was getting more and more inadequate. In primary schools there was a great diversity in the per head square foot area. Either it was too great or too small. Similarly, the picture regarding per head floor area was also equally dissatisfactory in primary and secondary schools.

FURNITURE

When the accommodation is the main problem of the most of the schools in greater Bombay, talking about the library furniture becomes a dream. The tables and chairs were insufficient in almost all schools of Bombay. Whereas in interior Maharashtra there were less number of readers and more reading tables. This reflects on the fact that students in interior Maharashtra are not motivated towards extra reading by school authorities. In certain secondary schools of Bombay branches were provided in order to accommodate more number of readers in the reading rooms. In spite of all these remedies and ideas reading facilities were found inadequate and unsatisfactory in most of the secondary schools in Bombay. In primary schools this aspect seems to be absolutely neglected.

AIR, LIGHT AND VENTILATION

Most of the schools in greater Bombay are situated in residential houses in congested areas. The condition of air, light and ventilation is very bad. The situation in interior Maharashtra was somewhat satisfactory in this regard.

STACK ROOM

In the absence of a separate library room, the existence of separate stack room is a mere dream. The books are mostly placed in locked cupboards in library rooms, corridors and office rooms or even in staff rooms.

TOTAL STOCK OF BOOKS

The total number of books in most of the secondary schools of Bombay was found insufficient. The main obstacle is an increasing number of books, and acute accommodation problem. In primary schools the attitude seems to be more satisfactory. In interior Maharashtra also there was insufficient stock of books in most of the secondary schools.

Out of the total books in stock, it was found that most of the secondary schools of Bombay had concentrated on the literature. Most of the schools had wide collection of books in their respective medium of instruction. The collection on other subjects of knowledge was far from satisfactory in majority of the schools in Bombay. In interior Maharashtra, the stock of Marathi books was found satisfactory but the number of books on English literature was poor.

REFERENCE BOOKS

The secondary schools of Bombay had a satisfactory collection of reference books, whereas the primay schools of Bombay and the secondary schools of interior Maharashtra did not have a satisfactory collection for the reference purpose.

STOCK OF BOOKS ACCORDING TO DIFFERENT AGE-GROUPS

A large number of secondary schools of Bombay had more novels and fiction books in their stock. The stock of books on biography, science or history, etc. was not satisfactory. As against this, from the collected data it was gathered that secondary schools in Maharashtra had a good collection of books on varied subjects of knowledge. The primary schools gave poor picture about the varied stock of books.

NEWSPAPERS AND PERIODICALS

Newspapers and periodicals are of a great importance because the children and teachers get the up-to-date information regarding the international affairs. It was found that most of the newspapers were kept on reading tables instead of displaying them either on boards or stands. As against this, newspaper boards were found to be more popular in the secondary schools of Maharashtra. In the primary schools newspapers were not received in most of the schools. The percentage of schools getting newspapers in different languages is given below

Newspapers	*Secondary Schools*	
	Bombay	*Interior Maharashtra*
	%	%
English	71	[illegible]
Marathi	46	[illegible]
Gujarati	41	[illegible]
Hindi	25	4

Motivation

The children need to be motivated in developing their reading taste, e.g. reading other than story books. This aspect seems to be very much neglected at all levels in most of the secondary schools of Bombay and Maharashtra. The library has a special mechanism and so it is very important to guide children in using the library. Of the various ways of motivation, narration of interesting events, episodes and anecdotes to the students of secondary schools of Bombay was quite popular. This pattern was also popular in secondary schools of Maharashtra. The new arrivals of books was announced to the students in the classrooms. Other display system was not found popular in the schools.

Issue System

In secondary schools of Bombay, books are issued in the library period. In interior Maharashtra books are mostly issued during the lunch hour. In both these cases no motivation or guidance is possible considering the limited time factor.

Organization of the Visits by the Classes to the Library

As mentioned earlier, the accommodation problem is the main hitch in separate library room, wherever such facility is possible the library rooms are not so much accommodative that the entire class can visit the library. Therefore, it has been mentioned earlier that books are given in the classroom. Even then, in few English medium schools, students are taken to the library in batches to show them the use and functioning of the library.

In Marathi-medium secondary schools of Bombay accommodation problem was so acute that only in certain cases, SSC classes and only staff members visited the library room. Only two out of 23 schools have full-fledged library and a fully qualified librarian, an assistant librarian and two peons. In such schools there are issue counters, issue card system and students from Standard V are taken to the library.

In Gujarati-medium secondary schools only five out of 28 schools have full-fledged school library with full-time qualified librarian and one peon. In these cases students from primary section to SSC level make use of the library and the reading-room.

The Librarian

In most of the schools the library is being run by a teacher or clerks.

In some schools there are part-time librarians where the librarians feel that they do not get time to give justice to the work. They can only keep the library in order. They get no opportunity to keep themselves in contact with readers. It is also the feeling of the principals of the schools that there is not enough financial assistance and so it is not possible to have a full-time librarian. These limitations hinder the progress of the school library and its functioning.

In the absence of a qualified librarian, excepting few secondary schools in Bombay and interior Maharashtra most of the schools the library-incharge adopts the classification methods which suits them. Author-wise cataloguing is most popular in most of the secondary schools of Bombay and interior Maharashtra.

CHOICE OF BOOKS

As there is class library system, and in each class few number of books are allotted to each class there is no much scope for a wide choice, only they get the choice from the allotted quota of books given to each class.

BUDGET

It has been recommended in the Mudaliar Commission that a school would require the services of a highly qualified and trained librarian, who should be on par with other senior teachers in pay and status. The following table gives the picture of the library budget of school which covers both purchase of new books and payment to the librarian. According to the rules laid down by Irene Wells, every school should spend Rs. 6 per child every year on purchase of new books.

ANNUAL LIBRARY BUDGET

Range in Rs.	Bombay		Interior Maharashtra	
	Sec. Schools	%	Sec. Schools	%
101 to 1000	18	36	[illegible]	60
1001 to 2000	9	18	4	20
2001 to 3000	2	4	[illegible]	10
3001 to 4000	2	4	1	[illegible]
4001 to 5000	6	12	2	[illegible]
5001 to 6000	3	6		
6001 to 7000	1	2		
7001 to 8000	2	4		
8001 to 9000	2	4		
9001 to 10000	2	4		
10001 and above	2	4		

AUDIO-VISUAL AIDS

According to Mrs. Ramamurthy, "the library should work towards becoming a resource centre rather than simply a repository of books". But as mentioned above finance is the biggest hitch in furnishing the library with audio-visual aids. From the data collected, only 41 per cent secondary schools of Bombay have audio-visual aids which include projector, view-master, and epidioscope. In rest of the schools the picture is very disappointing In interior Maharashtra only 19 per cent schools have projectors. Regarding geographical maps and science models and other maps they are kept in the respective rooms in most of the schools.

It could thus be concluded that condition of school library is very gloomy in all respects. On papers and in reports library has been given a vital importance educationally, but no provision has been made in the government syllabus for a library period. This study reveals many hidden and unnoticed facts and the author has tried to bring out these facts on the surface while studying this problem in detail. Further, it gives a scope to look into this vital aspect which has been neglected by the experts, administrators and pundits of education.

Measurement of Correlates of Hostility

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HOSTILITY is a general personality term which covers phenomena like anger, rage, resentment, violence, cruelty, destruction and many other forms of offensive behaviour. When these tendencies cross acceptable limits, the behaviour is called deviant and maladaptive in personal and social sense. In most of the cultures and societies this aggression is channelized in constructive forms, therefore [illegible] abnormal forms of hostility or aggression is found.

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* Thesis submitted to University of Poona (1976)

To a great extent, the industrial age is responsible for the instability of human life today. It has brought about a phenomenal upheaval in the social process. It has also brought tremendous competition. These have disturbed the simple, stable and secure life which men enjoyed before the advent of this age. It is the result of strain that the average man lives in a state of constant psychological tension. It results in anxiety which in turn becomes the cause of psychological and social insecurity.

When a student joins the college with a traditional background and comes in contact with the western world and culture through books, films, etc. he finds it pretty difficult to adjust himself to it. In most of the cases his college education is hardly related with his future career. Parents or guardians also do not give him proper guidance or confidence. This may lead him to have a hostile attitude towards the society.

Palsane (1970) has reported a number of problems which the students have to face in different fields of life. They can broadly be classified as, (i) educational problems, (ii) family problems, (iii) health problems, (iv) emotional and personal problems, (v) vocational problems, and (vi) social problems. All these problems could be brought under the conditions of insecurity and the hostile reactions are merely signs of insecurity, inadequacy or feelings of guilt. It is necessary to remove the cause of emotional turmoil to reduce and eliminate the hostile feelings.

If important cognitive and personality variables are measured and their influence on hostile behaviour is determined, it becomes very easy to control one's behaviour and predict it. The present work is an attempt to prepare a tool for measuring the degree of hostility among college population. The non-availability of any such tool prepared in India increases the importance of the study.

The importance of hostility and aggression in the development of personality is well known. In recent years serious attempts have been made to study aggressive or hostile behaviour from multidisciplinary points of view. Though the terms hostility, anger and aggression are used interchangeably, they convey different meanings. In the words of Green (1972):

> Aggression is a form of communicative behaviour between individuals and groups (normally of the species) that is directed at causing the flight or submission of the other or, if this does not happen, the other's injury or death. Aggressive behaviour occurs in the individual or the group as the result of a certain neural predisposition or proclivity (which we call aggressivity) in reaction to particular signals which have a threatening meaning for the individual or group.

> Anger is a response with facial, skeletal and autonomic components .. anger is like anxiety, which is a response with strong automatic components and which some psychologists conceptualize as a drive state (Bass 1961)

Hostility has a variety of meaning. It has been treated as a drive, emotion, attitude and also overt response. It may cause anger but anger is a temporary emotional state while hostility is a response that builds up slowly and also changes slowly. Anger and not hostility causes a lot of tension.

Foulds (1965) has defined hostility as "a unitary entity which could be directed inward towards the self or outward against other people or objects". This definition has also been accepted by the present investigator. Foulds' concept of hostility is based on the theory of personality and personal illness, which emphasizes that hostility is a direct result of the lack of mutual interpersonal relationships and empathy.

Psychologists have constructed different measures of hostility and some of the famous tools are MMPI, Iowa Hostility Inventory, Proposed Hostility and Pharisaic-Virtue Scale, Seigel Manifest Hostility Scale, Fisher Hostility Inventory, Zaks and Walters Aggression Scale, Bass Famous Saying Test of Hostility and the Bass-Durkee Inventory.

HYPOTHESES

The following hypotheses were framed for the purpose of the present study :

1. General hostility scores do not differ from one age-group to another.
2. Men are higher on general hostility than women.
3. General hostility scores do not differ from one educational level to another.
4. General hostility scores do not differ from one parental educational level to another.
5. General hostility scores of those with rural background do not differ from those with the urban background.
6. General hostility scores do not differ from one caste to another.
7. General hostility scores do not differ from one religion to another.
8. Achievement scores are not correlated with general hostility scores.
9. General hostility scores do not differ due to the participation or non-participation in games/sports.
10. General hostility scores do not differ due to the participation and non-participation in extra-curricular activities.

DEVELOPMENT OF THE TEST

The following sub-scales were used in the present test:

(*i*) Self-criticism [illegible]

(*ii*) Delusional Guilt [illegible]

(*iii*) Act-out of Hostility [illegible]

(*iv*) Criticism of others [illegible]

(*v*) Projected Hostility [illegible]

The tool is in the form of a personality inventory. After constructing the items, the inventory was subjected to expert criticism for content validity and as a result of this some items were eliminated. The responses have been classified in three categories always, sometimes, and never and the weight of 2, 1 and 0 were assigned to these according to the content of the items.

Variables selected for the present study were (*i*) age, (*ii*) sex, (*iii*) educational level of students, (*iv*) educational level of parents, (*v*) rural-urban background, (*vi*) caste, (*vii*) religion, (*viii*) level of educational achievement, (*ix*) participation in sports and games, and (*x*) participation in extra-curricular activities.

At the initial stage, 199 items were included in the inventory. A sample of 400 college students of undergraduate classes, consisting of boys and girls from Moradabad town, was selected. The inventory was administered to these students but for item-analysis purpose only 188 boys and 185 girls were retained. It was found that in case of boys the range of scores was 113 to 202 and that in the case of girls 109 to 232. Higher score in the inventory means greater hostility. For further analysis, 50 subjects who scored the lowest from both the groups (girls and boys) were selected as the criterion groups for the purpose of item-analysis. The chi-square test was used to determine the discriminating items. Out of 199 items, 76 items were selected which were found discriminating. A separate answer-sheet and scoring-keys were also prepared.

A random sample of 4,300 was used. These cases were drawn from 41 colleges of eight districts of northern U.P. which included both male and female subjects and the colleges represented both rural and urban background. For the purpose of preparing norms, 4,022 cases were considered. For both boys and girls of rural and urban areas, frequency distributions were prepared and the chi-square test was used to test the normality of the distributions.

The number of items included in different sub-tests are :

(i)	Self-criticism (SC)	17
(ii)	Delusional Guilt (DG)	9
(iii)	Act out Hostility (AH)	21
(iv)	Criticism of others (CO)	13
(v)	Project Hostility (PH)	16
		76

FINDINGS

Major findings of the present study are :

1 The rural males were more hostile than the urban subjects. The mean values for these two groups were 59.55 and 57.05, respectively.

2 Significant sex differences were observed. The t-value of 2.25 for urban males vs. urban females was significant at .05 level while the t-value of 4.96 for rural males vs. rural females was significant at .01 level. This shows that male subjects were more hostile than the female subjects.

3 The test-retest reliability coefficient was found to be 0.88 for the general hostility score.

4. The content validity was established on the basis of the definition and the description of the concept used in the present study while the construct validity was established through factor analysis.

The findings regarding different variables used are as follows. Analysis of variance was initially used for overall comparison of the means. When the results were found to be significant, the test was used for further analysis.

1. Hostility and age are positively related. It increases with age in the case of female subjects but this is not true in the case of male subjects.
2. Regarding sex differences on general hostility scores, no significant trend was observed.
3. Junior male subjects (first and second years) were more hostile than the seniors (third and fourth years). No such trend was observed in the case of female subjects.
4. The students of uneducated parents were more hostile than those of educated parents. No such trend was observed in the case of female subjects.
5. The rural boys were more hostile than the urban ones. No such trend was observed in the case of female subjects.

6. The caste does not have any relationship with the general hostility score.
7. There was no significant difference between the hostility scores of male Muslim and Hindu subjects but the t-ratio (4.48) for female Hindus and Muslims was statistically significant. The female subjects differed only marginally and the number of Muslim subjects was quite small. The null-hypothesis, thus, was retained till more data could be collected.
8. Those female subjects who had scored low marks in the examination were more hostile than those who had scored high marks. But more evidence is needed to verify it.
9. Those who participated in games/sports were less hostile than those who did not have any such interest.
10. The female subjects who participated in extra curricular activities were less hostile than those who did not participate. No such trend was seen in the case of male subjects.

[illegible]

17.

Women's Attitudes towards Selected Social Issues Concerning Women and Associated Factors

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THIS STUDY represents the social self of the women participants, residing in the Gorakhpur region. This area is supposed to be one of the most backward eastern part of Uttar Pradesh, one of the largest states of India. The establishment of a few central and state government concerns such as the Fertilizer Corporation of India, Air Force Station, medical college, radio station, engineering college, the university and many others, have led to the amalgamation of different cultural groups that have given colour to the rustic life. A significant change has been noticed in the internal and external behaviour of the people residing in this area. A question arose in the inquisitive mind whether the women nourished in the educational atmosphere of the colleges and the university will opt to change the uniqueness of the traditional society aad will try to merge it in the modern progressive way of life or wether they will create a balance between the modern and the traditional. The social norms of educated women have been judged by measuring their attitudes towards socio-economic, cultural, educational, marital and political aspects of life.

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*Thesis submitted to Gorakhpur University

THE STUDY

Two bipolar factors of the educational arena the teachers and the students form the universe of the present study. One group is that of the students who have been divided into four categories : (*a*) Intermediate arts and science, (*b*) Undergraduate arts and science, (*c*) Postgraduate arts and science, and (*d*) Teachers under training both B.Ed. and M.Ed. students. The second group includes teachers who are teaching in the nursery and primary schools, intermediate collegee, degres colleges, and Gorakhpur University.

The present group of this study was formed by the educational institutions of Gorakhpur region consisting of (*a*) Local nursery, convent and primary schools, (*b*) Intermediate colleges located at Gorakhpur, (*c*) Degree colleges affiliated to the Gorakhpur University, but located at some distance, *viz.* Kushi Nagar, Dercia, Basti, Bahraich, Jaunpur and Pratapgarh, and (*d*) Gorakhpur University.

Sampling has been done on two occasions, i.e. judgement sampling for pilot study and the stratified random sampling for the final study. One hundred women students and teachers were taken from each group.

Plan of the Study

Two sets of variables Dependent and Independent have been used. Dependent variables constitute the five scales measuring radical *vs.* conservative attitudes of the women towards : (*a*) Social and cultural life, (*b*) Education, (*c*) Marriage, (*d*) Profession, and (*e*) Politics. Nine sets of independent variables, supposed to be the possible causes of dependent variables, have also been taken : (*a*) Lower age-group *vs.* upper age-group, (*b*) Lower income group *vs.* higher income group, (*c*) Lower family education group *vs.* higher family education group, (*d*) Extremely conservative group *vs.* less conservative group, (*e*) Very progressive group *vs.* less progressive group, (*f*) Very religious group *vs.* less religious group, (*g*) Married group *vs.* unmarried group, (*h*) Hindu group *vs.* Muslim group, and (*i*) Science group *vs.* arts group

Genesis and Purpose of Inquiry

(*a*) The effect of independent variables on dependent variables
(*b*) Inter-relationship of the five attitude scales
(*c*) To work out the interaction effect to extract resulting factors
(*d*) To study the factors system closely in order to discern some underlying order that might lead to formulation of some concepts covering the attitudinal domain
(*e*) To locate the significant trends in women's attitudes

Methods of Response and Scoring

Likert's five-point scale of response was adopted. Subjects were asked to allocate 5-1 votes for a statement according to which they agreed very strongly, inclined to agree, undecided, inclined to disagree, or strongly disagree. In compiling each subject's total score, the votes allocated to unfavourable items were reversed and this total then reflected the respondents' favourable or unfavourable attitude of the total situation. On the basis of the results obtained from the criterion of internal consistency, the most differentiating statements of the final form were selected

RESULTS

Associated Factors

Independent variables, that are psychological, educational, biological and sociological in essence, were correlated to find out their significance on the attitudinal domain. The correlations showed that four pairs of independent variables, *viz.* socio-economic status, educational status, marital status and religious affiliation are not significant at .05 level Whereas the correlations between the other three variables, *i.e.* very progressive *vs.* less progressive, students *vs.* teachers and science *vs.* arts are significant at .05 level, the remaining two very religious *vs.* less religious, and very traditional *vs.* less traditional are significant at .01 level.

Five attitudinal scales were inter-correlated to be used for factorizing and Thurstone's centroid method was applied for this purpose. As only three factors were involved, for rotation, Thurstone's orthogonal procedure was applied.

Out of the nine dichotomous variables, four of them, viz. marital status, socio-economic and educational status of the respondent's family and the religion were statistically proved to be non-significant, hence, these may not be considered as operative determinants of women's attitudes. They may be treated as non-significant factors playing slight roles in the attitudinal domain.

The remaining five variables showed significant results. They indicated the operation of bipolar forces -progressive (radical) and traditional (conservative).

FACTORS

The three rotated factors were identified as: *(a)* Familial or marital, *(b)* Social, and *(c)* Vocational.

Factor (a)

This factor identified as familial or marital factor gives the highest loading in marriage and then turns to family, social and cultural affairs. Women have equated marriage with emotional and economic security that satisfy their psychological urge to seek security by marriage and get emotional entanglement by setting a home.

Factor (b)

This was identified as social factor. This is a pervasive factor giving a Gestalt model of figure and ground. Family appears to be the figure in a social setting. Educated women wish to be related with a higher and wider canvas of life. They do not want to be restricted with setting a home and producing children only, but wish to entangle themselves with various social, cultural, educational, and political activities of life. They appear to concern themselves with problems that are both individual and global by showing high bent of mind towards politics and education. Education was considered as an essential prerequisite for economic independence. It appears that education has been considered as an instrument for stepping the upward social mobility.

Factor (c)

Identified as vocational, this factor indicates that respondents have taken it for granted that after getting the necessary training and opportunity, they can handle all sorts of jobs. Personal intelligence and education is to be utilized to secure economic independence and to acquire experience and self-confidence. By directing their energies for purposeful ways, they want to involve themselves in social productivity.

CONCLUSIONS

Attitudes of educated girls and women, measured along continuum related to family, social and cultural aspects—education, marriage, career and active politics—reveal three underlying 'functional' [illegible] which enter into the formation of these surface phenomena. The three [illegible] of women teachers and students, as represented in the sample, are centred upon the family nucleus, which is supplied by [illegible] of marriage, of the wider background of political life [illegible] an influence on Indian life of living including the full-time work of the housewife, which women are inclined to view as their [illegible]. The factors derived here represent these three models [illegible] the enlightened Indian women, including nubile girls.

The overall picture reveals the fact that they are attracted towards two polarized directions—the family and the outside world.

SIGNIFICANT TRENDS

1. Though women teachers and students are in favour of adopting a pragmatic attitude towards social issues yet they are [illegible] by traditional norms, set by the family, social and cultural environments.

2. They have a deep sense of identification with their culture.

3. They are less agreeable to such traditional institutions like sect, caste and community. They are not afraid of breaking with [illegible] religious obligations.

4. Status symbol is not to be sought by jewellery and property but they are in favour of attaining cultural status in home.

5. Adequate education is considered as an essential prerequisite for economic independence.

6. They are in favour of co-education at all levels of education and desire no differentiation between boys' and girls' education. Vocational and professional education is preferred.

7. Marriage and jobs are considered equally important. Marriage brings emotional security and jobs bring economic satisfaction.

8. Respondents have displayed highly favourable attitudes towards politics. Their aspirations are for the post of Prime Minister, Vice President and President of the country.

On the basis of the data and the findings, it is possible to make a valid guess that the factors underlying the social attitudes of women students and teachers include favourable views of a general progressive nature, combined with modernity and a life of culture in the social milieu, and finally, a sense of practical relations, based on interest centring on marriage and political affairs that are colouring the present Indian life.

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Relationship of Attainment in Theory Subjects in B.Ed. Course with Attitude as a Teacher and Teaching Efficiency

RAM CHANDER

THE MAIN PURPOSE of this research was to find out relationship of the present-day theory courses in B.Ed. with teaching efficiency and teaching attitude of teacher-trainees, the main hypothesis being that two basic variables, viz. 'attitude towards pupils' and 'teaching efficiency' really formed the end objectives of any teacher training course and that the theory courses were only means to these ends.

TOOLS

Objective type achievement tests for five compulsory theory papers Principles of Education, Techniques of Education, Educational Psychology, Modern Indian Education and its Problems, and School Organization were constructed after trying them out for their reliability and validity. Besides, Minnesota Teacher Attitude Inventory (MTAI) was used to measure teacher-trainees' attitude. Teaching efficiency was, however, assessed on the basis of the practical skill scores in B.Ed. examination of the year 1973 of the Punjab University. A matrix of correlations between the scores of theory tests, MTAI and teaching efficiency was computed. Besides, factor analysis was done to see the pattern of syndromes of theory papers, teaching efficiency and attitudes towards pupils. Finally, the data was statistically interpreted.

SAMPLING

Of the 2,000 student-teachers in 11 colleges of education in the then Punjab, a stratified random sample of 500 student-teachers covering between 25 and 63 student-teachers each was taken up for the purpose of tryout of tests, measuring out their attitude and finding their teaching efficiency.

MAJOR FINDINGS

1. The study revealed varying degrees of correlation of teaching efficiency with theory papers and the MTAI. The product moment corre-

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*Thesis submitted to Kurukshetra University (1976) lation of the scores on this inventory with the scores in [illegible] papers ranged from .07, with school organization to .33 with educational psychology.

2. However, the present course in principles of education and modern Indian education did not reveal quite an appreciable relationship with the attitude of trainees towards their pupils.

3. The lowest correlation of teaching efficiency was found to be in the case of principles of education which is only .06 while the maximum, i.e. .33 in the case of educational psychology, followed by .25 in techniques of education, .18 in school organization and .11 in modern Indian education and its problems.

4.* It also shows that the content of the paper on principles of education has little to do with the practical skill of teaching in the class though it is only partially helpful in moulding teacher's attitude.

5. On the whole, the study has tended to reveal that the present course in *principles* does not have any relationship with teaching efficiency, that the present courses on modern Indian education and its problems, and school organization, also have only meagre relationship with teaching efficiency, and that the course on educational psychology has been found to make a sort of positive and appreciable contribution to teaching efficiency.

(*i*) The factor analysis results also revealed that attitude towards and teaching efficiency have little relation with present courses other than educational techniques and psychology, and the relation with these too is not quite substantial, it is rather poor in the former. However, it does indicate that thorough understanding of the child's development and of the learning processes and techniques form the two essential ingredients of the present courses which go to make any teacher education programme.

(*ii*) 'Principles of education' paper does not seem to be related either with the attitude of the pupil-teachers towards their pupils or their teaching efficiency in a practical way.

(*iii*) 'Techniques of education' paper seems to be a queer contradiction in itself because this paper is merely taught as a part of theory paper without maintaining any coordination with practice of teaching or teaching efficiency.

(*iv*) 'Educational psychology' paper seems to have a split function since it is revealed to be heavily related with attitude while heavily theoretical for teaching efficiency. Its contents may be so devised as to offer higher transfer value for increasing teaching competence.

(*v*) 'Modern Indian education and its problems' paper does not seem to have any relationship with attitude or for that matter with teaching efficiency; it seems to be meant more for educational administrators and policy-makers as it deals more with historical perspective of educational system and its problems than with teacher-taught, relationship or teaching practices. This seems to be merely a theoretical course under the present conditions.

(vi) 'School organization' paper is also more theoretical and as such does not contribute to the development of attitude or that of teaching efficiency.

CONCLUSION

The investigator suggests that the course contents of different theory papers need radical changes in order to make them functional particularly to help develop in teacher-trainees teaching efficiency and a positive attitude towards pupils. Thus, it makes out a case that theory courses in training colleges should primarily be related with proper attitude towards pupils and thereby improve their teaching efficiency.

[Abstract : D. N. Khosla]

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Guidance Programmes for Underachievers

SUBRAMANIA DANDAPANI

ACADEMIC UNDERACHIEVEMENT is one of the serious problems that concern the teachers, parents as well as the country. A developing country cannot afford to lose the potential manpower reserves. Attempts have been made by earlier researchers to identify the underachievers in schools and evolve remedial measures to solve the problem. In view of the fact that remedial programmes for solving the problem of underachievement were rarely attempted in India, an experimental study was undertaken by the investigator.

PROBLEM

The study was undertaken to determine whether or not high school male underachievers who participate in a group guidance and counselling programme and remedial help achieve significantly higher on an academic achievement test at the conclusion of the counselling period in comparison with the control groups of non-counselled underachievers and normal achievers.

HYPOTHESES

The following null hypotheses were formulated

i. There will be no significant difference in academic achievement among the adjusted means of counselled (group guidance and remedial help) underachievers and non-counselled underachievers.

ii. There will be no significant difference in academic achievement among the adjusted means of counselled underachievers and non-counselled normal achievers.

iii. The adjusted means in academic achievement of the non-counselled underachievers and non-counselled normal achievers will not differ significantly.

Besides the major hypotheses cited above, an additional hypothesis was formulated as follows :

iv. There will be no significant difference in academic achievement among the adjusted means of counselled underachievers belonging to the families of professional class group, merchant class group and clerical class group.

SAMPLE

The research population for the study was drawn from the boys of Standard X English-medium classes (N =680) studying in 12 high schools in Mysore city (urban) with ages ranging from 14 to 16 years

MEASURING INSTRUMENTS

Mental Abilities

For deriving the index of mental abilities, Group Test of Scholastic Abilities (GTSA-verbal), standardized by the State Bureau of Educational and Vocational Guidance, Bangalore, on a representative sample of 9,130 pupils of Standards VIII, IX and X was used. It had sub-tests such as synonyms, best answer, number series, analogies, classification and reading comprehension. The reliability and validity were found to be satisfactory.

Academic Achievement

A battery of academic achievement tests in general mathematics, general science and social studies at Standard IX and X levels for pre-test and post-test, respectively, were prepared. The test-items were mostly of multiple-choice type and were prepared with the help of a committee of experienced teachers handling the subjects for several years. Reliability and validity of the tests were found to be satisfactory.

Identification of Underachievers

The statistical technique of 'regression' was employed and regression-equations were computed to predict the pupil performance in academic achievement on the basis of his scholastic ability score. The predicted achievement score was compared with the obtained achievement score. Underachiever was designated as one whose obtained achievement score was more than 0.4 standard error of estimate below his predicted achievement score.

Formation of Groups

Out of the total sample of 680 pupils, 90 were identified as underachievers distributed in 12 high schools. Forty-five underachievers were chosen at random for inclusion in the experimental group. There were drop-outs after the first contact session. Only 30 underachievers availed of the help till the end. Another group of 30 underachievers constituted the control group. The investigator kept an additional control group of normal achievers (having no discrepancy between scholastic ability and academic achievement).

Guidance Sessions

A classroom was used in each school to meet the underachieving students. To avoid distraction, interviews with the underachievers were held before the commencement of the school during morning hours. The investigator used profiles of some eminent men from different fields for the following reasons :

(a) To stimulate the interests and abilities of the underachievers and arouse in them a desire for emulation.

(b) To enable them to identify themselves with the character presented in profiles and have vicarious experiences.

(c) To assist them in developing ego-strength and raising the level of aspiration.

Moreover, periodic quiz programmes on school subjects and general knowledge were conducted to modify their study habits and improve academic achievement. Ten interviews were held with the underachievers, each lasting about sixty minutes, except the first interview which lasted 45 minutes.

Between one interview and another a gap of 15 days was allowed. By the time the investigator completed one round of work in every school two weeks had elapsed.

Post-test

After allowing a gap of one month from the last interview, a post-test in academic achievement was conducted for experimental as well as the control groups (N = 90). Data-analysis was done by using analysis of co-variance method as outlined in Garrett's book, *Statistics in Psychology and Education* to answer the following two main questions

(a) Whether the underachievers in the experimental group improved their scores in comparison with those in the control groups in the post-test.

(b) Whether, among the underachievers in the experimental group, those belonging to the professional class families scored better than those from merchant class families and clerical class families

RESULTS AND CONCLUSIONS

Hypotheses (i) and (ii) were rejected on the basis of the data obtained. Academic achievement of underachievers in the experimental group was significantly greater (at .01 level) than that of the underachievers and normal achievers in the two control groups. Hypothesis (iii) was accepted on the basis of the obtained data. The two control groups did not differ significantly from one another. Hypothesis (iv) was rejected. While there was no significant difference in academic achievement among the underachievers belonging to the merchant class families and clerical class families, the underachievers belonging to the professional class families differed significantly (at. 01 level) from the other two groups.

Within the framework of the present study, a programme of group guidance and counselling services and remedial help resulted in significant gains in academic achievement for the sample of underachievers chosen by the investigator.

Research Notes

Bloom's Taxonomy : Review of Researches

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THE *Taxonomy of Educational Objectives*–*Handbook I : Cognitive Domain* (Bloom, B. S., *et al.*) is a device for classifying educational objectives according to the cognitive processes which reputedly underlie the achievement of them. The handbook was devised by university examiners who needed a method for classifying test items so that communication on testing matters could be facilitated.

Handbook I : Cognitive Domain consists of classification scheme in which a large number of educational objectives have been classified and the evaluation techniques appropriate to each class and sub-division have been presented and discussed. The six cognitive process levels, from least to most complex, are : (*i*) knowledge, (*ii*) comprehension, (*iii*) application, (*iv*) analysis, (*v*) synthesis, and (*vi*) evaluation. The processes are claimed to be hierarchical and cumulative.

A number of studies, which have relevance with the taxonomy, have been reported in the current literature. These studies fall into logical groups such as : (*i*) preparation of objectives for various courses in the light of the taxonomy (projects by Ayers, Carroll, Elliott, Ellis, Hanney, Jarolimek, Krathwohl, Man and others); (*ii*) classification by judges of ready-made test-items according to the levels of the taxonomy (efforts by Cox, Dressel, Klinchman, Lawrence, McGuire, Pfeiffer, Schannell, Stanley and others); (*iii*) applications of the taxonomy for curriculum planning (deliberations by Gagne, Irwin, Krathwohl, McGuire, Popham, Scott, Tyler and others); (*iv*) development of tests according to the levels of the taxonomy (works by Hunkins, Kellogg, Kilpatrick, Lessinger, Lombard, Schmadel and others), and (*v*) statistical analyses of taxonomy-type data (schemes undertaken by Allen, Anderson, Ayers, Helgeson, Klein, Kropp-Stoker-Bashaw, McQuitty, Miller, Smith, Stoker-Kropp, and others). The review of literature is restricted to the last two groups of studies only.

Development of Taxonomy-type Tests

Lessinger (1963) discussed how the taxonomy can be utilized to upgrade class instruction. A by-product of this approach through the efforts of the teachers in the Grossmont Union High School District, has been the collection of 566 carefully prepared geography test items. Similar test banks were reported to be in progress in English, social studies, foreign languages and mathematics.

Kellogg (1964) demonstrated, through American history test questions, how student achievement might be evaluated at several cognitive levels. His paper was intended as a model and working paper for teachers in the San Diego County.

Lombard (1965) suggested general types of science questions which test the six categories of cognitive objectives as prototypes for many specific items in different subject-matter areas. He maintained that the difficulty of an item is not necessarily related to its classification, and that there is a spread of difficulty levels within each category.

Hunkins (1966) suggested Bloom's taxonomy as a test construction guide. He discussed the utilization of the taxonomy in reference to the construction of multiple-choice test items. It was pointed out that some of the categories of the taxonomy (and not necessarily the highest levels) present some unique difficulties in writing of test items.

Kilpatrick (1964) presented the use of the taxonomy in devising mathematics tests for all cognitive levels in grades K-12. The tests were further developed and used for assessing math abilities and cognitive styles of attacking problems as part of the National Longitudinal Study of Mathematical Abilities.

Schmadel (1960) studied the relationship of creative thinking abilities to school achievement. Tests of evaluation and synthesis, as defined by the taxonomy, were constructed. Low correlation achievement measures were reported.

Statistical Analyses of Taxonomy-type Data

Smith (1965) used the knowledge and comprehension categories of the taxonomy as the basis for generating multi-choice items dealing with five basic education psychology concepts. Item analysis indicated a general but not perfect scaling of difficulty levels of the knowledge category. Examination of the intercorrelations of the sub-classes of the knowledge and comprehension categories failed to yield a hypothesized simplex. Thus the hypothesis of a hierarchical structure of the sub-levels of the first two categories was rejected. However, he obtained a positive low inter-item correlation in the three sub-levels of comprehension category. He further suggests that this might be due to chance.

Miller (1965) tested the cumulative hypothesis of the taxonomy using the Guttman simplex analysis. Approximately, 100 students were tested with items representing the first three levels of the taxonomy. The correlation matrices yielded the general pattern of a simplex. The pattern of the regression weights also was consistent with that expectant for the simplex model for the first three levels of the taxonomy in basic physical and biological sciences.

Thomas (1965) similarly studied the first three categories of the taxonomy. Guttman's simplex analysis was used to verify the cumulativeness of the categories. She reports that the three categories showed the general pattern of a simplex.

Turner and Dunn (1965) conducted a research which included an analysis according to three components of the test—knowledge, application and understanding. The knowledge and application categories were the same as named in Bloom's taxonomy. The sub-tests of understanding embraced the other four categories of the taxonomy. Significant correlations are reported between these categories. Results further indicate that (*a*) knowledge items were less reliable, as a group, than the other type items, and (*b*) various groups of subjects showed greatest relative differences on understanding type items. This latter result was a notable characteristic of the female *vs.* male variable.

Dave (1972) proposed a few theoretical hypotheses along with statistical models which are helpful in testing the assumptions implied in the taxonomy.

Dave and Anand (1973) selected only the first three levels of learning, namely, knowledge, understanding and application for testing cumulative hierarchy implied in the taxonomy. For this purpose, Anand's data collected for his Ph.D. thesis entitled 'A study of the effect of socio-economic environment and medium of instruction on the mental abilities and the academic achievement of children in Mysore State were subjected to further analysis. The achievement tests were not constructed with specific objectives and behavioural outcomes in mind. Items were subsequently classified by judges according to the three levels. The data were then subjected to McQuitty's (1966) hierarchical syndrom analysis. The results in general supported the KAU hierarchical syndrome.

Anderson (1964) used chemistry content to make a taxonomy-type test, based on the first four cognitive categories. Factor analysis of the pre- and post-test resulted into two clusters : knowledge and comprehension, and application and analysis.

Stoker and Kropp (1964) investigated two questions : Can judges agree in the cognitive process which a test item is intended to measure ? Can the imputed hierarchical structure of the taxonomy be empirically validated ? Inter-judge agreement was found with respect to the classification of test items in the intended category. General support for the hierarchical structure of the taxonomy is suggested by the data; however, a hypothesized factor structure was not supported by various factor matrices.

Klein (1965) attempted validation of the taxonomy with 7-9-year-olds. Objectives and corresponding test items were developed. Each item was classified as to which of the 21 taxonomy behaviours it required. Students were then tested after a semester's work. Content validity, internal consistency reliability, and item discriminations were established. It was concluded that not all the items were valid. Only some of the behaviours could be elicited and detected in the subjects. It was suggested that revisions be made in the taxonomy, but that it could be a valuable tool as it is.

Ayers (1966) conducted factor analyses on a 40-item multiple-choice test. The items were classified according to the taxonomy in order to provide a criterion for rotation of factors and to justify the classification. The hierarchical structure of the taxonomy was supported. The study suggests the analyses of longer tests which utilize more of the taxonomy categories.

McGuire (1963) investigated the intercorrelation of taxonomic levels in the field of medical studies and found a transcendence of levels of the taxonomy. In order to achieve better congruence with the objectives of medical education, the following revision of the original taxonomy is suggested. Knowledge, generalization, problem-solving of a familiar type, problem-solving of an unfamiliar type, evaluation, and synthesis.

Kropp, Stoker and Bashaw (1966a) discussed the major problems that may be encountered is an attempt to validate the taxonomy. The problems discussed were : *(a)* The choice of a response measure (process response, and product response), *(b)* the test content and format. *(c)* ambiguity of the knowledge category, and *(d)* statistical difficulty created by the hierarchical nature of the taxonomy. Several studies which would relate scores on taxonomy-type tests to certain criterion measures were suggested.

Desai (1969a) gave an analytical picture of the taxonomy. He provided behaviour specifications for all the categories of objectives. Desai (1969b) also outlined an experimental design to find out whether an empirical foundation for the widespread use of the taxonomy does exist.

Smith (1967) also utilized the hierarchical categories of the taxonomy in an attempt to develop scaleable sets of test items in the physical sciences.

Item sets consist of seven or eight multiple-choice items which attempt to build upon one another so that each succeeding item requires all the knowledge and processes of the preceding item plus a little more. Sample sets of items are presented and discussed in reference to the above criteria. Problems were encountered in trying to construct multiple-choice items for the application, analysis, and synthesis categories

Kropp, Stoker and Bashaw (1966b) reported a three-year long series of studies using all the six categories and designed to explore the construct validity of the taxonomy. This is perhaps the most elaborate and scientific study ever carried out to validate the taxonomy. The questions under consideration were the following : *(i)* Can empirical evidence be found to support or refute *(a)* the imputed hierarchical structure, and *(b)* the imputed generality of the several cognitive processes ? *(ii)* Can each level of the structure be explained by more elemental cognitive aptitudes, and, if so, do the combinations or numbers of them change systematically from one major level to the next ?

The hypothesis of inverse relationship between mean performance and taxonomic level was generally supported; the data supported the imputed hierarchical structure of the taxonomy. The hypothesis of the generality of process was not clearly supported; the data suggest that the specific test score being analyzed is determined by highly complex interaction of content and process. Investigation of the third question revealed the obvious need for more refined analytic techniques and data from more refined taxonomy-type tests.

Smith (1968) used Kropp, Stoker and Bashaw's (1966) data and subjected the inter-correlations to the hierarchical syndrome analysis of McQuitty (1966). This study in general supported the cumulative and hierarchical character of the taxonomy.

Pachaury (1971), who analysed Helgeson's data (1968), obtained intercorrelations on eight sub-tests and a total test on a population of fourth, fifth and sixth grade children and subjected them to McQuitty's hierarchical syndrome analysis to verify the hierarchical and cumulative character of the taxonomy. The results in general support the cumulatively hierarchical structure of the taxonomy, but not unanimously as in earlier studies.

Madaus, Woods and Nuttal (1973) used Kropp, Stoker and Bashaw's data (1966b) to construct a quantitative causal model to test the cumulative hierarchical structure of the six major taxonomic levels of the taxonomy by measuring the strengths of the linear relationships (links) between levels. The assumed hierarchy should have direct links between adjacent levels and should have no direct links between non-adjacent levels. The magnitude of these direct and indirect links was measured by consructing a causal model using multiple regression procedure. A parallel causal model method of analysis was used for determining the effect of introducing a 'g' factor of general ability into the casual flow of the taxonomic structure. The results of the study suggest that both the direct and indirect causal links of the cumulative hierarchical taxonomic structure are extremely dependent on a 'g' factor.

Stedman (1973) as cited by Dave (1976), having administered a 93-frame programme in genetics based on 23 behavioural objectives to 144 subjects from eight high school biology classes reported that *(i)* hierarchy of categories is cumulative is possibly in error, and *(ii)* the categories of the taxonomy are hierarchically arranged is acceptable only if the hierarchy is viewed as progressing unevenly from low cognitive levels to higher cognitive levels. The cognitive processes involved in moving from comprehension to application appear to be different from those between knowledge and comprehension or application and analysis.

Dave (1976) tested the following hypotheses in his voluminous research work : *(i)* differences exist among the levels of learning identified as knowledge, understanding and application, *(ii)* the levels K, U, A form a cumulative hierarchy, *(iii)* differences exist among the levels of learning identified as expected behavioural outcomes (EBOS) within each category, and *(iv)* the levels of learning identified as EBOS form a cumulative hierarchy within each category. (There is a hierarchy of EBOS within the hierarchy of objectives). His sample consisted of 2,430 subjects. Dave's major findings are : *(i)* the overall data supported the KUA hierarchy, *(ii)* while there existed differences among different levels of learning (EBOS) the assumption regarding they being cumulatively hierarchical did not get significant support.

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General Awareness of Military Career among Rural and Urban Students

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SEVERAL STUDIES (Cook 1962, Gautam 1975) have reported that the military career occupies the third place among the vocational preferences of the students. These studies have been conducted on the above quoted studies (Gautam 1975) that the occupational preference of the military career among the rural students is expected to be further lower in view of their limited general awareness of the vocational world in the general and military career in particular due to inadequate communication system, limited social mobility and host of other psycho-social factors. However, no study has been conducted to find out the rural students' awareness of military career. The present study is an attempt in this direction. It aims at comparing the level of military awareness among both the rural and urban students and identifying the antecedents of the difference, if any.

Sample

The urban population is heterogeneous socio-economically. The parents choose a school for their children as per their socio-economic status. For instance, the upper class parents send their children to the Convent schools while others accept the government and the government-aided schools. Similarly, the Central Government employees, specially the Defence personnel, send their children to the Kendriya Vidyalayas. To make the urban sample representative of such a diverse population, it was decided to include each type of school in the sample. As a result three local schools—St. Joseph's High School, C.A.V. Inter College and the Kendriya Vidyalaya, Manauri—were chosen to provide the students for the study. Since minimum academic qualification for commission in the Indian

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*Paper presented at the 64th annual session of the Indian Science Congress Association, held at Vishakapatnam from 3 to 7 January 1977.

**The author is thankful to Col. Daulat Ram, President, 11 SSB, for his encouragement to undertake this work, and to Shri A.R. Hindi for his valuable help in the preparation of questionnaire and analysis of data.

Armed Forces is higher secondary school certificate, it was decided to conduct the study on Standard XI students. As a result, 20 students from each of the above three schools were randomly selected from the classrooms to form the sample of urban students.

The rural group was selected from an inter college of a village Kaurihar which is situated along the Allahabad-Unchahar Road about 30 Kms away from Allahabad. There were 62 students in Standard XI of this institution. Since some of them were absent on the day of data collection, only 50 students were included in the sample consisted of 110 students -60 urban and 50 rural.

Method

Five service-officers from the Selection Centre East, Allahabad, were requested to write down the minimum information regarding military career that students of Standard XI should possess in their opinion. On the basis of their responses, the military career was divided into three areas, namely, the structure, selection and training and the function. Suitable questions pertaining to the three areas were framed and given to three psychologists separately for their comments on various aspects of questions like relevance, difficulty level and language. The questions were then suitably amended as per their views.

Data Collection

The questionnaire was administered to each group of students separately when the class teacher was present in the class. They were told in advance that this was purely a scientific study and their cooperation was important for obtaining valid results. They were seated at adequate distance from one another so that their responses could be frank and free. The rural students were divided into two groups and each group was given the qestionnaires successively. Since the questionnaire was in English, it was translated in Hindi for them.

Data Analysis

Each response was assigned a score value of 1. Thus, the maximum score that a student could secure was 44. A correct response was awarded 1 score and the incorrect one was given zero. All the questionnaires were scored accordingly. The total score that a student secured was called an 'awareness score.' The average awareness scores for both rural and urban groups and also for each of the schools are given in Table I.

The same for various brackets of parental education and income are given in Tables 2 and 3. The average score for each of the three areas of military awareness, i.e. structure, selection and functions were also calculated. The same for both the groups, namely, rural and urban, and also for each of the schools are given in Tables 4 and 5.

TABLE 1

AVERAGE AWARENESS SCORES FOR THE RURAL AND URBAN GROUPS AND ALSO FOR EACH OF THE SCHOOLS

Region	*School*	*Mean Awareness Score*		*Value*
Rural	Kaurihar Inter College	7.30	7.30	9 59
Urban	St. Joseph's High School	24.40	19.73	p. 01
	C.A.V Inter Colleage	12 30		
	Kendriya Vidyalaya	23.00		

TABLE 2

AVERAGE AWARENESS SCORES FOR THE RURAL AND URBAN GROUPS AS PER PARENTAL EDUCATION AND INCOME

Parental Status	*Rural Students*		*Urban Students*
Parental education	Illiterate/up to Std. V.	6.76	11.40
	Between Std. V. to B.A.	8.44	19.55
	B.A and above	—	24.35
Parental Income	Up to Rs 500 p.m.	7.30	11.88
	From Rs 501 to 1000 p.m.	—	21.17
	Above Rs 1000 p.m.	—	23.40

TABLE 3

AVERAGE AWARENESS SCORES AS PER URBAN SCHOOL CUM PARENTAL STATUS

Parental Status		*Urban Schools* *St. Joseph's High School*	 *C.A.V Inter College*	 *Kendriya Vidyalaya*
Parental education	Illiterate/up to Std. V.	—	11.40	—
	Between Std. V. and B.A	—	13.38	23.67 p 01
	B.A. and above	24 35	10.71	22.00
Parental income	Up to Rs 500/- p. m.	—	11.64	13 50
	From Rs 501 to Rs. 1000 p. m.	23.47	12 67	23.25 p.01
	Above Rs 1000 p.m.	26.80		24.70

TABLE 4

MEAN AWARENESS SCORES OF THE RURAL AND URBAN STUDENTS FOR THE THREE AREAS OF MILITARY AWARENESS

Region	Areas of Military Awareness *Structure*	 *Selection and training*	 *Function*
Rural	3.34	0.70	3.26
Urban	9.73	4.90	5.27
G. Mean	6.83	2.99	4.34

TABLE 5

SCHOOL-WISE MEAN AWARENESS SCORES FOR THE THREE AREAS OF AWARENESS

Schools	Areas of Military-Awareness *Structure*	 *Selection and training*	 *Function*
Kendriya Vidyalaya	10.90	6.05	6.05
St. Joseph's High School	11.30	6.55	6.55
CAV Inter College	7.00	2.10	3.20

Discussion of Results

Table 1 reveals that the mean awareness scores (7.30 and 19 73) of the rural and urban students are significantly different from each other. It implies that the urban students' awareness about military career is significantly greater than that of the rural students. This disparity can be largely explained in terms of the regional differences between the two samples. But the very fact that the mean awareness scores of the urban students themselves studying in three different schools are different, prove that it is not the region *per se* but rather its certain aspects which affect the military awareness of the students. Home and school are such two aspects which differentiate the two regions markedly and can, therefore, be logically stated as important determinants of military awareness. Besides, these are also the most important constituents of the society in which the pre-adolescent pupil move about. Both of them are discussed below.

Table 2 displays the awareness scores of both the group as per their parental education and income. Parental occupation has not been included for two reasons. Firstly, the parental occupation of all the rural students was agricultrure. Thus, there could be no comparison with urban students whose parental occupations of the urban students were too varied with the result that the number of students, falling in each of the occupation, was too small to provide logical conclusion.

Table 2 reveals that as the level of parental education increases, the mean awareness score also goes up. This trend is visible in both the groups, rural as well as urban students. For example, among the rural students those whose parents are either illiterate or educated up to primary school only, have secured 6.76 as the mean awareness score while the same for those whose parents' educational level falls between Standard V and B.A. is 8.44. There are no students in this group whose parents' education is B.A. or above the urban group also shows a similar trend. The mean awareness score of the students falling in the category of lowest parental education is 11.40 while that of those who fall in the highest brackets is 24.35. Thus, it becomes evident that the parental education is positively related with the level of military awareness of the students.

Table 2 further reveals that the parental economic status is another determinant worth consideration. In the urban group, the students having lowest parental income (Rs. 500 p.m. or less) have obtained 11.88 as the mean awareness score while those in the upper income backets (above Rs. 1000 p.m.) have secured 23.40 as the mean awareness score. It is not possible to discern the same trend among the rural students since all of them fall in the same bracket of low income. However, their mean awareness score (7.30) also is low and much less than that of their urban counterparts.

Thus, it can be concluded that the difference between the levels of military awareness of the rural and urban students can be explained in terms of the parental income and education. But this is contradicted by Table 3 which reveals that the mean awareness scores of the students belonging to the same brackets of parental education and income but studying in different schools are different. This is more obvious between the St. Joseph's High School and the Kendriya Vidyalaya, on the one hand, and the CAV Inter College on the other. For instance, the mean awareness scores of the Kendriya Vidyalaya and the CAV Inter College students having the same parental education (between Standard V and B A.) are 23.67 and 13.38, respectively. The same trend is seen in case of the highest bracket of the parental education, with the St. Joseph School students securing 24.35 as the mean awareness score and the CAV Inter College students securing 10.71. All these differences are significant statistically at 0.1 level. The differences between the St. Joseph High School and Kendriya Vidyalaya are only marginal and non-significant statistically. Similarly, the students of the three schools having the same parental income have secured different mean awareness scores. For instance, the students of the St Joseph's High School and the Kendriya Vidyalaya have secured mean awareness scores 23.77 and 23.25, respectively, while those of the CAV Inter College have secured 12.67 though all of them belong to the same bracket of parental income (Rs. 501-1000 p.m.). It is here again the CAV Inter College students who differ significantly from the students of the other two schools. These differences can be explained more plausibly on the basis of the school itself than on any other factor. But the fact that the students of the same school belonging to different parental status have secured different mean awareness scores may be interpreted that the school does not play absolute role in determining the level of military awareness. But these intra-school differences are only marginal and not significant statistically, except one (13.50 and 23.25/24.70) in the Kendriya Vidyalaya. However, this mean awareness score (13.50) is low probably due to the fact that there were only two students falling in the category of lowest parental income who have provided this mean score. Hence, this score cannot be taken as reliable as other mean scores. Thus, it can be concluded that the parental education and income are important determinants of military awareness. However, more important is the school in which the students study. The Convent schools and the Kendriya Vidyalayas are more conducive to military awareness than the ordinary schools.

It is also evident that the students of the St. Josph's High School and the

Kendriya Vidyalaya are closer to each other than the CAV Inter College in terms of the military awareness. This can be partly explained in terms of the similarity between the samples and partly in terms of similarity of psycho-social climate of the schools. However, the identification of such aspects of this climate as are more conducive to better awareness of military career falls beyond the scope of the present study. But this can be safely concluded that some of those aspects are missing from the CAV Inter College or to some extent from most of the ordinary schools. The above-mentioned conclusions should, however, be accepted with caution since the samples of the three schools are not absolutely comparable in terms of the parental income and education. Apart from the limitation shown above that there were only two students in one category of parental income in the Kendriya Vidyalaya, it can also be seen that there are no students in the St. Joseph's High School whose parents' education is below B.A. or whose parental income is less than Rs. 501 p.m. Similarly there are no students in the Kendriya Vidyalaya whose parents' education is not above Standard V.

So far, the overall awareness of military career has been discussed It will be further useful to know which areas of the military career are relatively more familiar to the students. Tables 4 and 5 serve this purpose. It is evident from Table 4 that the students, both rural and urban, are the most familiar with the structure of the military and the least familiar with the selection and training. Awareness of the functions of military falls between the two.

Table 5 provides school-wise information. Every school shows almost the same trend as stated above. Besides, in each of the three areas of awareness, it is the St. Joseph's High School whose students have secured highest mean awareness scores. In other words, the Kendriya Vidyalaya follows the St. Joseph's High School closely and the CAV Inter College falls much low. However, there is still much scope for improvement in every school including the St. Joseph's in view of the maximum scores being 16.16 and 12 for the three areas - structure, selection and training, and functions, respectively. But the CAV Inter College, though an urban school, needs it maximum.

Thus, it is evident that it is not the region but rather the parental background and the institutional environment which determine the level of military awareness of the students. That is why the students studying in the CAV Inter College which is an urban institution are much less informed about the military services than those of the St Joseph's High School and the Kendriya Vidyalaya. However, more important is the finding that the difference between the students of the St. Joseph's High School and the Kendriya Vidyalaya in terms of military awareness is only marginal and non-significant statistically. Since there is vast difference in the cost of education in both the schools, the parents should think seriously and objectively over the choice of a school for their children. On the basis of the present study, this much can be safely stated that so far as the students' military awareness is concerned, the Kendriya Vidyalaya, Manauri is as good as the St. Joseph's High School which is considered probably the best Convent school of Allahabad.

Conclusion

The rural students have much less awareness of military career as compared to their urban counterparts. Parental education and income are positively related with the level of awareness. School as a psycho-social climate plays an important role in imparting military awareness to the students. The St. Joseph's High School and the Kendriya Vidyalaya students are much better informed about military career than their counterparts from other urban school, the CAV Inter College. There is very little difference between the students of the Kendriya Vidyalaya and the Convent school. In every school, the students have been found relatively least informed about selection and training in the military services. This is probably an important reason why the number of applicants for the defence services does not reach the expected level.

The findings suggest that there is an urgent need to provide optimum information regarding military career not only to the rural schools but also to the urban schools. The SSB personnel can be adequately used from time to time for this purpose. Studies should also be undertaken to find out the relative effectiveness of various media of communication.

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the DD group were found to be appreciably higher than the corresponding ID group scores. This lack of clarity could probably be attributed to (*a*) the limited duration of the experiment, and (*b*) the remedial nature of instruction. Only 20 per cent of the DD group, however, registered zero and negative progress in comparison to 44 per cent of the ID group, thus reflecting the relative superiority of the DD method over the ID method. The progress scores of the pupils were compared with their scores in the diagnostic test which suggested that the DD method was more effective for pupils with poor initial scores.

Discussion

Only tentative inferences can be drawn from this study in view of the limited duration of experiment and the limited number of pupils. The results are, however, quite revealing. The DD method, based on the cognitive-codes-learning theory (Carroll 1965), appears superior to the ID method not only on the basis of the progress scores but also because it is found to be favourable to the 'weaker' learners who indeed require greater remedial care. The 'deductive' and 'inductive' methods adopted during this study were analogous to the 'explicit' and 'implicit' methods of Oskarsson (1973). In view of the similarities in our findings and those of Oskarsson's, Seliger's (1975), and other studies referred to earlier, it will be quite reasonable to suggest that explanation followed by pattern drill is not only a more effective strategy for teaching L_2 grammar than the audio-lingual approach, but is also a favourable strategy for remedial teaching. Since this was only a pilot study, the results of a detailed study should indeed prove to be of considerable interest. Hence the results of the present study should rather be treated as indicative than conclusive.

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A Cluster Analysis of Some Operational Measures of Pupil-Teacher's Performance at the B.Ed. Level

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WHY IS TEACHING mostly ineffective? Are teachers trained and evaluated for all that they are expected to be is the question that is often encountered by those who think that for a desirable change to occur in the system of education, it must first be reflected in the education of teachers. At least this is a question worthy to be considered at the secondary school level, as facilities exist for training teachers all over the country.

It is, nevertheless, true that the defects present in the education of our children are present in the education of our teachers. Teaching in schools continues to be bookish in nature, disregards higher mental abilities, gives scanty scope for work and skills and as such, presents a hopeless future for the learner. Education Commission, while making recommendations emphasizing the need for better methods of teaching and evaluation in training institutions explicitly stated that *(i)* individual library work, preparation of reviews and reports, case studies, project work, discussions and *seminars should form an integral part of the work of training institutions* and *(ii)* early steps should be taken to expand the use of internal assessment in the scheme of evaluation (p. 74). Skeptically enough some universities and institutions giving teacher education have chosen to introduce internal assessment in the scheme of evaluation with a view to make close observation and assessment of individual items of 'work of the student under training' possible for the teacher-educators. The present study attempts to identify mutually inclusive clusters of operational variables which may be regarded in the evaluation of teachers at the B.Ed. level. The study was carried out in 1974-75.

PROCEDURE

Sample

A group of thirteen female graduate pupil-teachers offering methods of teaching physical science as one of the optionals was taken as the sample.

Collection of Data

Five areas of pupil-teacher's work were considered in eleven variables hypothesized for the purpose. These have been listed below with notes giving the method of collection of data.

A. Achievement :

1. Written test. Marks obtained in the half-yearly test in methods of teaching physical science.

B. Individual Assignment :

2. Internal assessment. Total marks based on individual items of work.

This involved independently prepared lesson plans, observation record, unit plan, test materials and teaching aids.

C. Incidental Individual Work :

3. *Work tallies.* Tallies given for items of work done incidentally and as noted by the investigator. This included participation in the assembly, discussion, debates, seminars and workshops, dance and drama, club activities, library and project work. Most of the concrete things done and activities carried out individually were given tallies.

D. Bulletin Work :

The bulletins considered for the purpose came as end-products of a project on light. During the project pupil-teachers were rigorously involved in the preparation of pictorial and descriptive bulletins involving comprehensive display of subject-matter. At the end they were asked to prepare and display one bulletin each on a topic individually assigned to them. Six measures of which five ratings were derived. Each rating was given by a separate judge.

4. *Bulletin quantity.* Estimated by the investigator. This included number of main ideas, number of sentences, number of individual figures plus one mark for the use of colours.
5. *Bulletin organization and balance (rating)*
6. *Bulletin subject-matter (rating)*
7. *Bulletin artistic ability (rating)*
8. *Bulletin correlation (rating)*
9. *Bulletin understanding (rating)*

E. Creativity :

Writing as many uses of 'charcoal' as possible in a ten-minute written group test.

10. *Charcoal fluency.* Number of plausible uses.
11. *Charcoal originality.* Number of unique uses (i.e. which occurred only once).

Limitations

(*i*) Practice teaching which involved giving a required number of lessons was not considered. The presumption was that it deserved a separate study.

(*ii*) No effort was made to control any aspect not considered in the study. The pupils were busy undergoing the course undiverted.

Presentation and Analysis

Considering the limitations it was thought that a cluster analysis of variables would suffice to make rough grouping of variables and speculation on their operational nature possible.

Table 1 gives the eleven-variable inter-correlation matrix. The correlation coefficients are Pearson's (Garett 1969, Formula 30, p. 143).

TABLE 1

ELEVEN-VARIABLE INTER-CORRELATION MARTIX (N=13)

Variable	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*
1. Written test		47	40	16	42	16	27	—16	48	49	62*
2. Internal assessment			90	44	56*	53	—05	20	46	40	64*
3. Work tallies				38	58*	49	00	—03	40	38	58*
4. Bulletin quantity					74*	95*	07	39	28	49	68*
5. Bulletin organization and balance						80*	26	03	42	52	60*
6. Bulletin subject-matter							—28	33	45	40	43
7. Bulletin art								—27	—03	28	05
8. Bulletin correlation									08	—13	09
9 Bulletin understanding										13	44
10. Charcoal fluency											64
11. Charcoal originality											

†Decimal points have been omitted.

*For df =11 at .05 level r>.553 and at .01 level r>.684 to be significant.

Variables 7, 8 and 9 did not bear significant relationship with others and among themselves. They were excluded from further analysis.

Table 2 gives the resulting eight-variable matrix of inter-correlations. Numbers 7 and 8 stand for charcoal fluency and originality in this Table and in the succeeding analysis. This Table was subjected to cluster analysis. Table 3 gives the correlation coefficients for each variable listed in the order of size.

TABLE 2

INTER-CORRELATION MATRIX OF EIGHT SELECTED VARIABLES

Variable	1	2	3	4	5	6	7	8	Total
1. Written Test		47	40	16	42	16	49	62	2.72
2. Internal Assessment	47		90	44	56	53	40	64	3.94
3. Work tallies	40	90		38	58	49	38	58	3.71
4. Bulletin quantity	16	44	38		74	95	49	68	3.84
5. Bulletin organization and balance	42	56	58	74		80	52	60	4.22
6. Bulletin subject-matter	16	53	49	95	80		43	41	3.76
7. Charcoal fluency	49	40	38	49	52	40		64	3.32
8. Charcoal originality	62	64	58	68	60	41	64		4.19
Total	2.72	3.94	3.71	3.84	4.22	3.76	3.32	4.19	

†Decimal points have been omitted.

TABLE 3

CORRELATION COEFFICIENTS LISTED IN THE ORDER OF SIZE

Variables	.15— .19	.20— .24	.25— 29	.30— .34	.35— .39	.40— .44	.45— .49	.50— .54	.55— .59	.60— .64	.65— .69	.70— .74	.75— .79	.80— .84	.85— .89	.90— .94	.95— .99
1	4 6					3 5	2 7			8							
2						4 7	1	6	5	8						3	
3					4 7	1	6		5 8							2	
4	1				3	2	7				8	5					6
5						1		7	2 3	8		4		6			
6	1					7 8	3	2						5			4
7					3	2 6	10 4	5		8							
8						6			3	1 2 5 7	4						

TABLE 4

WORKSHEET OF CLUSTER ANALYSIS OF EIGHT VARIABLES

(1) Preceding cluster	(2) Summing of Γ within variables	(3) Sum of correlations between Γ and variables already in cluster	(4) Sum of correlations among variables in cluster = (3)+(4) from preceding line	(5) Sum of correlations of variables with variables not in cluster = 2—2 (3)+(5) from preceding line	(6) K = Number of variables in the cluster	(7) K(K-1)÷2 = Number of inter-correlations in the cluster	(8) K(n-k) = numbr of remaining inter-correlations	(9) Mean inter-correlation in cluster (4)÷(7)	(10) Mean of the remaining inter-correlations (5)÷8	(11) B-coefficient = (9) ÷ (10)
B(4,6)	3.84+ 3.76=7.60	.95	.95	5.70	2	1	12	.95	.475	2.00
B(4,6,5)	4.22	1.54	2.49	6.84	3	3	15	.83	.456	1.82
B(4,6,5,8)	4.19	1.71	4.20	7.61	4	6	16	.70	.476	1.47
B(2,3)	3.94+ 3.71=7.65	.90	.90	5.85	2	1	12	.90	.488	1.84
B(1,7)	2.72	.49	.49	5.06	2	1	12	.49	.42	1.17

Result

As could be noted from the analysis, four groups—two clusters B (4, 6, 5, 8) and B (2, 3) and two singlets (1) and (7)—could be identified. Such a grouping was fairly supported by the striking similarity of the variables in the culster and also by the dissimilarity of the profile-trends shown by the four groups.

DISCUSSION

Bulletin quantity, subject-matter, organization and balance, and charcoal originality have stood together. Individual work variables assigned as well as incidental have stood together. In the event of rigorous analysis of data collected from a large sample, there is a likelihood of further separation of a pure factor from the first cluster involving three facets—organization, originality and content—which may be termed as 'originality in the organization of content'. The second cluster may be identified with individual independent work. Fluency of ideas and written test have stood apart.

CONCLUSION

Written test alone of the kind employed in this study as in most university examinations, does not cover the abilities operating in the remaining three groups. This is suggestive of the need for separate consideration given to them in the internal assessment in the scheme of evaluation. A factor analytical study may, however, be necessary to substantiate such findings and also to find new areas essential for successful evaluation of the pupil-teacher's work. □□

Book Reviews

Development of Human Organisms

The Psychology of Human Development. Leland H. Scott, The Macmillan Company of India Limited, 1974, pp. 486 Price : Rs. 17.50.

THE BOOK has sixteen chapters devoted to the discussion of the standard variables of early growth without which hardly any understanding can take place on the wide topic of development of human organisms. The author has condensed vast information into meaningful chapters so organized that all the basic information is there. There is a slant on functionality of organismic structures, on the usefulness of these for the survival and development, and expansion of the human person.

It is apparent that due to the vastness of the material available to be put into a book of this nature the author has approached the problem by including most of the different ideas, approaches, etc. without going into detail. At least the reader gets to be introduced to different ideas if nothing else. This approach also helps in bringing the latest ideas into focus.

The chapters on 'general functional effectiveness' is very appropriately included unlike many other books on child development It helps in understanding the beginnings of individuality and organization of the young one as a person from the earlier to the later stages.

The chapters on genetics and reproduction, physical development, motor development provide details on topics covered under these headings and give information to make it meaningful to the student.

Learning, intelligence, perception have been discussed from the general psychological as well as developmental functional point of view. Merely giving information about these usually does not make the student and reader appreciate the focus of such organized behaviours expressed in day-to-day life during growth period. Theories of learning and intelligence have also been discussed in an introductory fashion. Chapters on vital functions has been included by the author to point out that these are essential functions, affect growth of the whole person, are related to motivational and emotional aspects of the child. To a large extent the early socialization of children is started with these functions and later on it is found that early habits in handling these functions have some vital relationship in the organization of mature behaviours. In our country poverty with poor diet is found related with deficient growth.

It is shown that the child is genetically equipped with the apparatus of producing phones of all human languages. From birth onwards the desirable language develops through stages mentioned as 'babbling, 'echolalia', 'imitation', etc. The factors that facilitate this learning in early stages are the amount and quality of speech he hears, the number of persons he interacts with, the amount and quality of verbal interaction with mother. Teachers and educators may be interested in this aspect of development.

Thinking is considered as higher cognitive process. It consists of representing in one's consciousness of objects, persons, situations and relations which may not be perpetually present at the time. Memory, retention, recall are the processes which makes the above possible. Children can express thinking behaviour, by overt performance—enactive mode, by sensory images--iconic mode and by words, numbers etc. —symbolic mode. Generally, there can be autistic thinking and productive thinking. The author gives detailed evidence to show that all this is based on extensive learning.

Emotions have been discussed from expression aspects of behaviours. Clinical, general, adaptive, specific problems and their handling have been mentioned. There is not much mention about the self-control of these nor the socialization aspects of emotional behaviours. The author has taken somewhat arbitrarily the types of variables he considers as more important in the information of personality. No doubt, physique, ability to function effectively, to develop adaptive qualitative characteristics and general disposition are important in personality formation. However, it may be mentioned that one cannot leave discussion of the topic there.

In a book of the type under review it may be conceded that an introduction only is possible about adolescence phenomenon. The author arbitrarily considers ten years as the span for this age. Further, he divides this period into pubescence, middle adolescence and later adolescence and shows that these stages show characteristically different features. Some controversial western culture oriented observations are included in the discussion of 'self-identity' among youngsters. Naturally, there is a lot of room for further discussion. Again, in viewing maturity and integrational factors no more than cursory introduction and discussion has been made. The usual pattern of generational interaction in a family has been taken as standard and a smattering of stereotyped information from western culture has been provided.

The book is extremely well documented and provides some applicable measures for practical use. The approach is pragmatic and functional. It will be a good material for higher level child study courses and introductory developmental psychology courses. There may be some interested teachers, mothers, and parents who will get insight into how to handle various age-groups, growing human beings. It may be recommended for most libraries of educational institutions to have the book on their shelf.

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* * *

Microteaching Research in Britain

Investigations of Microteaching. Donald McIntyre,
Gordon Mcleod and Roy Griffiths. Croom Helm,
London. 1977. Price : £8.95 net

ALTHOUGH often we are critical of our slackness in adopting innovation in education, particularly in teacher education, 'micro-teaching' found a rather quick and important place amongst our teacher educators. First Indian experiment was conducted in India as early as 1967 by, Prof. D. D. Tiwari at G. C. P. I. Allahabad. Further few experiments during 1969-71 resulted into adopting this as a field of planned research in the Centre of Advanced Study in Education, Baroda. The NCERT took it up in a still bigger way from 1975 onwards. Today, many researchers are taking interest in this area. It is in this context the reviewer sees the relevance of this review of the book which represents a major British project in microteaching research conducted in the University of Stirling.

Although microteaching was very much in use in quite a large number of teacher-training institutions in the USA in the late sixties, the British universities with their usual conservativeness did not show any enthusiasm in this regard. It was left to two new universities, Stirling and New University of Ulster.

In Stirling this project was initiated by the first Head of the Education Department, Prof. Elizabeth Perrott, now Head of the International Centre for Microteaching at Lancaster University. The present volume accommodates researches conducted between 1969 and 1975.

The nineteen experiments accommodated in this book has been presented under six broad categories. These pertain to Students, Attitude, Analysis of Students' Teaching Behaviour, Students' Evaluation of Observed Teaching, Experimental Studies in Microteaching, Students' Perception of the Microteaching Behaviour, and Assessment of Microteaching by Subject Specialist Tutors. It devotes, profitably, a chapter on 'Towards a Model of Microteaching'.

When one goes through the pages of this book one is bound to get a mixed feeling. Over-emphasis of British research on students' reaction-cum-perception, etc. is reflected in this volume while Indian researchers also did go to this area but kept themselves within resonable limits and depended more on rigorous laboratory and field experiments with varied and intrigued designs. As a researcher, one looks at this area of micro-teaching—research-reaction-perception grid—more with the purpose of establishing propriety and viability of the technique. But it seems the simplicity inbuilt in this type of research allured more and more researchers in Britain.

However, one can safely draw the attention of researchers to four experiments in chapters 7-10. All the four are well conducted experiments with usual but appropriate designs. But the most interesting study is on 'Effects of Differential Training and of Teaching Subject on Microteaching Skills Performance'. While it shows that major, intermediate, minor treatment rarely makes significant differences on selected microteaching skill performance one is reminded of Wagner's (1973) study on effect of cognitive discrimination training and microteaching on changing teacher behaviour. Singular Indian effort so far on similar lines—effects of microteaching training, and introduction of the concept of teaching skill through literature on general classroom teaching competence—by the reviewer and others, however, showed both have significant effects while microteaching training is a better one.

Part six is another interesting cluster of chapters devoted to subject-specialist tutors' assessment of microteaching. In the present form this is again a series of 'surveys' of opinion. But as we know that thinking has set in, one would expect experimental studies on relevance of microteaching training in development of skills relevant to particular subject. Thinking in this directtion has already set in India.

The last chapter devoted to a model building on microteaching is a highly skillful and challenging exercise; nevertheless, it seems to be too hasty in absence of adequate empirical evidence. Comparatively, Indian research on microteaching has covered much more ground and has experimented much more rigorously into the mechanisms of the training. However, such well-knit comprehensive report is absolutely missing.

The volume is an extremely useful reference to microteaching research in Britain. This group of studies represent the work of a rather core group of British researchers in this area; although one can always refer to the cross-cultural studies of Prof Perrott of Lancaster and the works of Andrew Trott at Bulmershe and of George Brown at Nottingham.

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Restructuring Higher Education

Problems of Higher Education in India : An Approach to Structural Analysis and Reogranisation. K.L. Joshi Popular Prakashan, Bombay, 1977, pp. 312. Price: Rs. 18.00

QUITE a few academics and individual researchers have attempted to analyse the problems of higher education since the publication of the voluminous, but extremely readable, Report of the University Education Commission (1948-49). Another major attempt was made by the Education Commission (1964-66), which surveyed the entire gamut of Indian education and made some important suggestions for revamping the system of higher education. It would, however, be far from correct to say that the last word has been said about the problems of Indian higher education. In this context, the recent work of K. L. Joshi makes a significant addition to the literature in this important field.

Joshi's book is in three parts; the first two parts are devoted to introduction and a historial (at times critical) review of the recommendations made by the various Indian and foreign committees/commissions on higher education. The third part, 'Structural Changes and Reorganisation' contains his basic thesis about the restructuring of higher education in India.

The author has analysed the problems of higher education mainly from the point of view of structural reorganization "in such a manner as to secure economy and efficiency". He has been critical of the Education Commission (1964-66) in which more than 90 per cent of the report supports "uncritically the existing machinery of administration of education, particularly at the Centre and its satellites in the States." As a result of this, new lines of economy, efficiency and organization have not been thought of.

Joshi's contention is that in an underdeveloped country, like India, all efforts should be directed towards economic progress. Once the country becomes economically self-sustaining, two demands, which are interdependent, automatically follow, viz. manpower requirements and educational and training programmes. Logically it follows that if we do not have resources for the time being, we must create resources through economic sectors like they did in England in the nineteenth century. This necessitates a new planning outlook of structural changes, systems analysis and effective utilization of resources. Joshi's thesis can be summarized under two main heads :

(*i*) Reorganization of the educational structure at the secondary and university stages, and
(*ii*) coordination of higher education in a federal set-up.

About the structural reorganization, the author has been critical of the recommendations of the Education Commission about the 10+2+3 pattern and the National Policy Resolution on Education which, while recommending a broadly uniform pattern all over the country, vascillated about locating the plus-two stages either in schools or colleges or both, according to local conditions.

Joshi's suggestion is that in order to clarify the confusion, the schools should be reorganized as a 10-year institution on the USSR pattern uniformly in all States. This should be followed by a two-year institution, community or junior colleges, as separate institutions incorporating other institutions of the same level in existence today along with a large number of vocational courses of different duration and varieties. These two classes can also be continued in the existing degree colleges and the universities should be made responsible to hold the examination at the end of two years both for community/junior colleges and the existing colleges giving the degree of Associate of Art or Applied Sciences.

According to the author, the community colleges, which is a "new social invention intervening structurally between the school and the university" would offer not only academic training for students, who will join degree colleges but also provide terminal courses of vocational type and improvisation of any other type of course for the community by any training programme, His suggestion is to bring all such institutions under the university by affiliation and the examination will be conducted by them. As a part of this suggestion, the author has suggested that polytechnics numbering 307 and junior teacher training colleges numbering 1600 should be converted into community colleges over a period of next five to ten years. The industrial training institutions, technical, commercial and agricultural schools, etc. should also be brought under the scheme of multipurpose junior colleges offering courses for the duration of six months, one year, one-and-a-half years and two years according to need. According to Joshi, the proposed junior colleges will have the following functions in a coordinated manner :

(*i*) Providing terminal curricula of two years or less in length in vocational, technical and semi-professional courses ;

(*ii*) Providing transfer curricula preparatory to advanced undergraduate education in the proposed three-year degree courses in the university ;

(*iii*) Providing general education for all students, terminal and transfer ;

(*iv*) Aiding students to make educational and vocational choices, that are consistent with their individual aptitudes and manpower requirements in the economy at different levels ; and

(*v*) Offering a wide range of general and special courses for adults in the form of continuation studies, conferences, forums, concerts, exhibits, special studies and a number of short-term courses relating to the community needs.

Without denying the need for structural reorganization, it may be emphasized that structure is at best a mean for improving the system of education. Our main problem has been that having (half-heartedly) introduced structural changes, we become complacent with the result that the desired modifications fail to materialize, causing frustration and cynicism all around.

While agreeing with the author that the junior colleges should offer a variety of terminal courses for the school-leavers, the question will have to be argued whether the school system has to be prolonged by the addition of two years or the system as it prevails in some States of having these two years with the universities should be continued with the addition of the device of the junior/community colleges. It is difficult to have a very rigid posture in this regard, because the position varies materially from State to State. Quite a few of our universities, to quote the author, are 'diffused and ill-organized'. To saddle them with the academic and administrative problems of lakhs of students at the intermediate level would make them top heavy and unwieldy.

The author has also discussed the concept of open university. His view is that the open university of the British type is unsuitable for our country. Instead, one or two universities in each state should be developed as 'open' universities (the remaining can afford to be 'closed' !). These institutions should provide facilities to students appearing privately with organized self-study courses as in the USA. There should also be a coordinating body like the Central Council of the British Open University at the Centre, which should be a clearing-house for various academic problems of this arrangement, and they should make recommendations and suggestions, which should be followed up in the universities systematically. This is a very sound suggestion and need to be implemented without further loss of time.

About coordination of higher education, the author has, among other things, analysed the role of the UGC in relation to the central responsibility of coordination and determination of standards of higher education and research. Based as it is on the experience of the author as the former Secretary of the UGC, it assumes considerable significance. According to him, the Indian UGC has not built up an independent approach like the British UGC. Moreover, it is difficult for the Indian UGC to operate on the principle of "equal and opposite unpopularity" with the government and the universities. It is not only the Central Government, the universities and the UGC, but there are State Governments and the Planning Commission to be reckoned with. This makes the position of the UGC full of complexity. "It is always unpopular with the Planning Commission, which can be easily understood (The reason for this generalization has not been explained) but its unpopularity with the State Governments does not help the State universities very much, which are much more influenced by the policies of the State Government rather than those of the UGC.

The author thinks that, in a federal structure of Indian polity, the British pattern of the UGC does not work. Therefore, he has suggested that a Ministry of Higher Education like the one in the USSR or the Coordinating Department in the USA be established at the Centre in which will be merged the present UGC or, alternatively, the present UGC might be converted into the Ministry of Higher Education. As a consequential arrangement, the present Ministry of Education should deal with school education, cultural relations, CABE, international organizations, etc. Higher education should be defined to include all post-school education where the school is defined as a 10-year institution on the pattern of the USSR. This will also mean that the educational and the training programmes of the Ministries of Health, Agriculture, Labour, etc. would be brought under the coordinating agency of the Ministry of Higher Education.

It is not difficult to appreciate the validity of the observations made by the author about the constraints under which the UGC has to function and its apparent ineffectiveness to fulfil its role in coordination and determination of standards of higher education. It is, however, not certain whether the setting up of a Ministry of Higher Education will, *ipso facto*, bring in the necessary corrective action. The basic idea of establishing the UGC was to serve as a buffer between the Government and the universities. It had been experienced that the universities had to deal with the bureaucrats, who had no knowledge of the working of the universities and, more often than not, were tempted to deal with the problems of higher education from a purely bureaucratic and financial angle. The proposed Ministry of Higher Education, which would be an administrative ministry and most of the senior posts would, according to the author, be occupied by the civil servants, drawn from the Indian Administrative Service, will have the effect of putting the clock back and reverting the academic community to the pre-UGC days.

Limiting the role of the present Ministry of Education to school education, cultural programmes, etc. is also of a dubious value. Constitutionally, education including universities is a state subject. The Central Government has, however, a definite responsibility in the coordination and determination of standards of higher education and research, etc. It can be argued that so far as school education is concerned, the Ministry of Education has no direct responsibility and may as well be wound up! Even for higher education, it has delegated its responsibility to the UGC and the All India Council for Technical Education. Divesting the present Ministry of Education of whatever limited role it has in education will make it an ineffective organization and may not be in the larger interests of educational development in the country.

The solution that commends itself in the Indian situation is threefold :

(*i*) To bring all higher education under the academic umbrella of the UGC. The present truncated UGC cannot play an effective role in the integrated development of higher education.

(*ii*) The Central UGC should have regional offices at convenient places so as to serve, among other things, as eyes and ears of the Commission.

(*iii*) The State Governments should establish grant-giving bodies on the pattern of the Central UGC to provide a buffer between the State bureaucracy and the universities.

The book has been written in a lucid style and is well documented. The data has been painstakingly sifted and systematically presented. The conclusions are based on logic and reasoning. One is struck by the author's passionate desire to bring about improvement in the system of higher education. The book will be equally useful to students, teachers as well as the enlightened public, who have some interest in the problems of education. It is also hoped that it will stimulate thinking among those, who are concerned with decision-making in respect of the development of higher education.

A welcome addition to the existing literature on Indian higher education !

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JOURNAL OF INDIAN EDUCATION

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A QUARTERLY JOURNAL OF EDUCATIONAL RESEARCH

INDIAN EDUCATIONAL REVIEW

VOLUME FOURTEEN NUMBER TWO APRIL 1979

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Reading and Electronic Media

PRAMILA AHUJA

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“READING MAY BE one of life's inexhaustible pleasures and blessing”, declared Walter de la Mare. Stevenson goes a step further when he states : “Reading takes us out of our country and ourselves.” Reading relieves emotional preturbances. Often a right book fulfils a psychological need at a typical moment when the radio or television programmes may be anything but agreeable to a mood.

Through reading, man can ponder over the mysteries of the world, explore accumulated knowledge, and contemplate the unknown. From this search, he begins to uncover some answers to questions ; he is stimulated to raise more questions and to continue his pursuit for deeper understanding. It can carry him to distant lands and acquaint him with people he would otherwise not know. It extends his experiences, giving him a glimpse of the world's excitement, pleasure, and wisdom (Howes and Darrow 1968).

Reading is and must necessarily remain dominant and universal means of sharing experiences and ideas and developing understanding. John Ciardi (1964) writes :

> A good book gives you a life you haven't time to live on a clock and it gives you a geography you cannot enter physically, an imaginative landscape. A great book is different from a good book in the size of the landscape and in the dimension of the light it gives you. If you think you can get to be a full human being without having some contact with the experiences that the race has stored, I think you are wrong It need not be any one list. I am talking about reading not as a matter of accumulating facts, that's a separate and entirely respectable process but as a process of accumulating experiences.

David Russell* once said that a writer only begins a book. It is the reader who completes it. The reader takes what he can from the printed pages, but it is the thoughts and feelings that are stirred up within the reader that carry him beyond the mere print. A book, whether it be written for children or adults, is only as good as the effect it has on the reader.

Reading does different things for different people, bringing different kinds of results. It can bring new skills and increase knowledge. Interests and appreciation can be expanded and deepened, powers of problem-solving and critical thinking can be improved. Reading can have an impact on one's life by helping him to become a self-fulfilling person, to gain new social and personal insights, and to understand and strengthen his values. Reading is one of man's ingredients for blending his inner psychological world with the outer social world, and emerging into a new world of thought, imagination, and reality It becomes an avenue for growth to the degree to which it stimulates both intellectual and emotional aspects of personal and group living (Howes and Darrow 1968).

Wapels, *et al.* (1940) reports the results of his studies of the effects of reading on groups of people. He has identified five general areas :

a. The instrumental effect : the results of reading for knowledge, information
b. The prestige effect : the results of reading for self-approval.
c. The aesthetic effect : the results of reading for the beauty of expression
d. The respite effect : the results of reading that relieves tension.
e. The reinforcement effect : the results of reading that inforces our attitudes

William K. Durr writes in the foreword of a book by Winkeljohann (1973) :

> Why do we teach reading when more and more electronic media of communication are becoming available to us ? Is it because each person should have a right to derive his own interpretation of literary works through a more personal interaction with the author's printed thought rather than through a middleman's interpretation brought to us electronically ? Is it because each person should have a right to savor and analyze the beauty and power of printed language at his own individual pace rather than at a machine dictated pace ? Is it because, even in the days of electronic miracles, the responsibilities of citizen-

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*Quoted in Anderson, Verna Dieckman. *Reading and young children.* London : The Macmillan Co /Collier-Macmillan Ltd., p. 5, 1968 (2nd printing 1969)

> ship cannot be fully met without the ability to dissect the efforts of those who would influence our thoughts through the printed word ?

To ask 'Can reading be replaced ?' is as good as 'Can teacher be replaced ?' 'Can machine power replace manpower ?' The electronic media are providing us with magnificent results. Machines are replacing human brains. Computers have started thinking on our behalf. DeBoer and Dallmann (1964) rightly remark that yet technology has not replaced reading The printed page still reaches millions still untouched by electronics, and for those who can take advantage of the newer devices, reading will serve unique purposes... It is still the only time machine that can recreate the events of the past and open up the vistas of future....If all the inventions of a hundred years were destroyed and only books were left, man could still be man, in the sense intended by the idealists, the poets, the great creators.

Reading meets the need which the electronic media cannot fully satisfy. Gray and Rogers (1956) express their viewpoints in the following words :

> It is an indispensable factor in modern life, interwoven with work recreation, and other activities of young people and adults. Its great value lies in two facts : printed materials provide the most illuminating and varied records of human experience that are now available ; and they can be examined and restudied time and again at the reader's convenience in acquiring clear understandings, in developing rational attitudes, and in reaching sound conclusions. Some of these values cannot be attained so effectively through other media because the individual is not free to pause and deliberate at will.

Daniels (1970) writes as follows :

> There are voices heard today that the world in the last two decades has lived through a "communication revolution" and argue that the advent of instant communication (television, radio, telephone, tape recorder and a dozen other electric devices working at the speed of light) must have catastrophic impact upon the modes of intellectual growth in our modern society and therefore on our education system. There are those who put this point of view more crudely, "TV replaces the book" or even further "TV replaces the book and the teacher who makes book comprehensible."
>
> As usual the overstatement is only a mere shadow of truth. He would be a rash man indeed who would deny that the communication revolution has not influenced the old equation that literacy is the gateway to knowledge. Our children today will think and behave differently

because TV is here to stay. It is also true to say that the full potentialities of the new media are only just emerging out of the brilliance of their technical achievement. Yet it is my belief that these glimpses we have caught emphasize once again that the power to create new worlds for man to live in rests secure, in the "hands" of the printed word and of men's skills to hear what to say.

Reading has unique contributions to make which other media cannot fulfil. Some of the distinct advantages which 'reading' enjoys over other means of communication have been listed below :

1. Reading material is readily approachable and information is easily rechecked. Sources can easily be compared.
2. One can react as an individual only with the help of eye-mind coordination and no mediator in between.
3. One can pause and ponder—memories can also be renewed.
4. One can make use of a selective approach. At one time he skims and at other times he reads carefully and analytically.

The other day the author was going through a book *The Politics of Reading* (Winkeljohann, 1973). Since the book happens to be directly related to the topic at hand the author would like to share with the readers some of the ideas which caught her special attention. The book is a bundle of reactions on Neil Postman's *Harvard Educational Review* article, in which the question 'What is reading good for ?" has been forcefully asked. Reactionaries are Claudia Converse and Ralph C. Staiger, William Jenkins, Robert E. Beck, John Donovan, Frank Smith, Lee Deighton, and Robert F. Hogan. Finally, a rebuttal by Neil Postman has also been given.

Postman's fundamental criticism of reading is that it is out-dated in a technological society. To him, 'print is not dead, it's just old - and old techniques do not generate new patterns of behaviour'. What would happen if our schools took the drastic political step of trying to make the new technology the keystone of education ? He asks and in reply to his own question makes the following statement (Winkeljohann, 1973) : The school would look something like an electric circus—arranged to accommodate television cameras and monitors, film projectors, computers, audio and video tape machines, and radio, photographic, and stereophonic equipment. As he is now provided with textbooks, each student would be provided with his own still-camera, 8mm. camera, and tape cassette....New evaluation procedures would come into being, and standardized tests—the final, desperate refuge of the print-bound bureaucrat—would disappear. Entirely new methods of instruction would evolve. In fact, schools might abandon the notion of teacher instruction altogether.... Teachers would have to stop acting like teachers and find something useful to do, like, helping young people to resolve their more wrenching emotional problems

The question remains, however, whether the electronic media are capable of supplanting reading as a way of experiencing the world and as a source of social mobilization, as claimed by Postman. Moreover, the mass market requirement imposed by the high costs involved limits the content of such media to that which will be acceptable to a substantial group over a short time span.

Postman suggests that written language has lost all utility as a media of communication. He also asserts that "an important function of teaching reading is to make students accessible to political and historical myth" without noting that reading might also provide grounds for rejecting such myth. One inestimable advantage of writing is that it forces the writer to make 'statements' which can then be examined, analysed, and even evaluated. Criticism is inherently a literary mode.

Postman also argues that written language has been misused and worn out, that the world is full of written garbage. But people need not read everything that has been written—one advantage of being able to read is that you can be selective. The only thing is reading requires effort. Squirting a video camera at "life" is an indiscriminate way of being creative. There is no reason in believing that video tape can do better than written language. Smith has rightly pointed out : "Reading about a good meal does not reduce hunger, but neither does a picture of it."

"The age of the printed word is not coming to an end", comments Deighton. There are more books, journals, and newspapers published, purchased, and read today than ever before, and the paper industry happily predicts that the growing shortage of book papers will intensify in the next five years.

Postman asks : 'What is reading good for ?' Hogan straightaway replies : 'You might as well ask, what is a car good for?' Same answer : 'Almost anything.' What is reading, or a car, 'good' for ? So many things that trying to enumerate them is like trying to count the stars with the naked eye on a clear night. People read because there are things they want to know, and the cheapest, easiest way for literate people to find them out is to look them up. 'What is reading good for ?' this question must not be posed to teachers of reading but to men such as the pupil of Freire who reacted : "I could not sleep last night...because last evening I wrote my name . and I understand that I am I... This means that 'we' are responsible."*

In spite of the fact that the seven scholars have given their comments arguing the importance of the printed media over electronic media, Postman would not yield In retrospect, he speaks : "So far as I can tell, the major points I made in my article stand, hardly even ruffled by the winds of controversy". He further states : I am arguing that in our own culture print, for all its advantages, is a psychologically conservative medium in comparison with the electronic media. .. I am arguing that in the fact of unprecedented media innovation, it is reactionary to hold the view that nothing can take the place of print. It is also dumb. A lot of media will be taking the place of print—indeed, already have This does not mean that print will disappear. But its power will be (has been) reduced and it can never have the same meaning it once had in our concept of an educated person.

For a moment, let us assume that we decide to vote in favour of electronic technology replacing the medium of print altogether, what will be the result ? 'Maximum investment with minimum output'. What will you do when sometimes electricity fails ? Hogan is worth quoting in this context :

> The reason I cling to reading is at least twofold : when the impact is almost too much, with a flick of the reading eye I can relieve it over and over till I've decompressed · no lifting the needle arm, no pushing the backup button, no waiting for the film to go through, rewinding it, and running it again; and when the circuits blow or when an ice storm cuts off the power for two or three days, and my hunger for restoration begins to hurt, all I need is two candles and a new poet.

Perhaps Neil Postman feels that the electronic media will make the task easier and interesting keeping in view the novelty factor. But my worry is altogether different There are bound to be some technical problems.

Competent and fairly exhaustive research studies have cast serious doubts on the popular belief in the efficacy of television as a medium of intelligent and purposeful communication and education. According to Dr. Fred Emery, a leading communication expert, who recently visited India, it has been found that exposure to TV makes the human brain drowsy and passive and it has little value for anything other than advertisement and entertainment. These findings are based on a study of the responses of the viewers to television as well as neurological experiments on the effect of a

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*Quoted in Illich, Ivan D., *Celebration of awareness*. Garden City, New York : Doubleday and Co., Inc., p. 154, 1970 constantly flickering TV pictures on the brain*

Intelligible speech cannot go beyond 150 or at the most 200 words per minute whereas silent reading speed can go even beyond 900 words per minute, if one makes use of contextual constraints. Otherwise also the gap between oral reading speed and silent reading speed is very wide. More man hours will be wasted if instead of 'reading' a person uses electronic media which make him to use only his ear for reading. Eye can see faster than the voice can utter or the ear can hear and follow the message. Secondly, every time the person does not use his auditory organs to gain messages and if he does, he will soon get physically exhausted. There are times when one just likes to have a bird's-eye view of the reading material without wasting much time. At that time he can just skim over the reading material with fantastic speed and get the required comprehension. In reading, one is always at an advantageous position. He can make the things to go in his own way sometimes making use of windlike speeds and at other times making use of slow, careful reading speed. Even an average adult reader can read from three to four times as fast as the usual person talks. An efficient reader can gather as much information by skimming a newspaper for five minutes as he could obtain from a fifteen-minute broadcast. Since reading is a personal affair, reading process is much more adjustable to the reader's individual needs. One can rather cover much more materials in a comparatively lesser time. Moreover, reading embraces a greater range and variety of material than is available through any other media. The printed page also constitutes a permanent record of the best and most considered thinking of creative minds throughout history. The reader can make use of these minds as well.

One can read silently for longer hours at flexible speeds without tiresome efforts whereas comprehension of the same materials through electronic media will be a slow and tiring process. We read different books for different purposes at different occasions at different speeds. We cannot expect these qualities from electronic media as more time and energy are sure to be consumed. Sometimes one has to make use of only ears and at other times ears and eyes both.

Electronic media can be used proportionately as and when required but to say that "those of us in education should not identify ourselves with the idea that only through print can we educate the imagination or cultivate refined and precise thought", does not sound appropriate in terms of mountain of print we consume even today.

Ours is a paper-pen civilization where reading holds a prominent posi-

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*Another look at TV. Editorial, *Indian Express*, 17 Aug. 1976, p. 6.

tion. This prominent position can never be snatched by any other media. If other media can come forward to join hands with reading—most welcome, but nothing can replace reading. We cannot imagine a world barren of books. World without books will be a strange place to live in. Other media may come and go, but *reading* will keep holding supremacy ever. Even if we replace it by some other electronic media, I am sure that it will be a bad economy.

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Role Performance in Role Conflict Situations

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WHILE THE WORKING PARTY on Educational Planning, Administration and Evaluation[1] thought, on one hand, that the sensitivity to demands and needs of the people would increase administrative effectiveness, Chase (1965), on the contrary, observes that unless there is an attempt towards resolving the conflicting expectations, leadership operates under heavy handicap. The research evidences are yet to establish that perception of incompatible expectations is associated with some particular patterns of role performance.

Since Getzels and Coladarci (1955) presented their theory of educational administration, in which the behaviour of an individual in a social system has been defined as the function of the interaction between role and personality (B RXP), the concept role, on which the role theory had been developed later on, has evoked a plethora of studies in the field. Role conflict is a concept derived from this theoretical model. The studies by Getzels and Guba (1954,1955), Campbell (1957), Bidwell (1955), Rosen (1955), Gullahorn (1956), Twyman and Biddle (1955), Gross, *et al.* (1958), Seeman (1953), Laulicht (1955) and Simmons (1968) are noteworthy in this area. Among them all, except that by Neal Gross, *et al.* have confined their focus on the study of the phenomenon of role conflict. As such while surveying the available studies up to date, Lipham (1964) highlights a significant research gap in the field and observes that the major weaknesses of role conflict studies are failure to determine causation and failure to relate extent of conflict to significant criterion variables even those of immediate nature, such as rated effectiveness or satisfaction.

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*The investigator is indebted to Dr. L.K. Oad, Principal, B.V. College of Education, Banasthali Vidyapith for his benign guidance in conducting the Ph.D. work, on which this paper is based.

[1] The Report of the Working Party on Educational Administration, Planning and Evaluation in the Fourth Five Year Plan. *Naya Shikshak/Teacher Today* 2; 2, Jan-March 1979, 6.

It is further startling to note that in India little work has been done in this field. Only the phenomenon of role conflict has been studied at an exploratory level which includes the incidental finding made by Sharma (1967) and Bhogle (1969) and a few others at Ph.D level and Sharma (1968) at M.Ed. level. Hence the remarks made in the review article in *The Encyclopedia of Educational Research* (1960) are pertinent :

> So far no study has appeared in which role expectations were measured and corresponding role performance observed directly. This startling lack of information leaves the researchers and educational administrators somewhat in the dark about the true meaning of findings for role expectations which, on one hand, might verify the postulates emerging from the theoretical relevance for identification, selection, training and placement of educational administrators

Hence it is worthwhile and interesting to identify the role conflict situations as experienced by educational administrators and study the corresponding patterns of role performance.

Here it may be noted that there is some basic controversy about the definitional problem of role conflict on the point of actor observer perception. While Getzels and Thelen (1960), Jacobson, Charter and Lieberman (1951), Seeman (1953), etc. do not count the perception of the actor as a necessary criterion to label one as a role conflict situation, the other group of scientists like Parsons (1951), Stouffer (1949), Gross, *et al.* (1958), Brookover (1955), etc. insists on the actor's perception of incompatibility in expectations as a criterion for a role conflict situation. The investigator in the present context, regarded 'actor perception' as the logical and necessary criterion for a role conflict situation

Objectives

The main objectives of the study were :

1. To identify the situations, which are perceived to be role conflict situations by the role incumbents while performing their institutional roles.
2. To study the pattern (s) of role performance of the role incumbents experiencing (a) high role conflict, (b) low role conflict, and (c) moderate role conflict towards finding relationship between the intensity of role conflict and the different patterns of role performance.

Delimitations

The scope of the study was limited to the following :

1. The variable 'role' includes only the institutional role of educational administrators (here, the headmasters of secondary and higher secondary schools). It excludes other roles expected or performed in the out-of-school life As such the study is confined to the intra-role conflict dimension of the phenomenon.
2. The concept of role conflict implies the perception of incompatible expectations held by the counter position incumbents. It does not consider the 'role-personality conflict' dimension
3. The geographical area of the study is the state of Rajasthan.

Hypotheses

To study the phenomenon of role performance in the context, the investigator used the normative standards instead of the evaluative criteria that is implied in the 'competence approach'. Under the normative approach, various patterns of role performance were located in the identified role conflict situations. For this, as was conceived by Neal Gross, *et al* (1958) in the theory of role conflict resolution, three dimensions of role performance of headmasters were visualized. They were :

1. The conformity dimension to include the behaviour which conforms to one set of expectations against the other in a role conflict situation.
2. The compromising dimension to include the behaviour when the role incumbent tries to prevent the occurrence of the situation or to interpret the roles/situations to justify his action or to discuss the problem with a person or group to convince or to conform partly to both the conflicting expectations.
3. The avoidance dimensions include the behaviour which the role-incumbent aims at avoiding the responsibility by transferring the authority/responsibility to some person or a committee either to take action interpreting the existing rules or to take action evolving a criterion policy at its own The role performance of a headmaster who refers to the rule or authority to initiate action, but becomes lenient and disinterested, has also been included under this dimension.

A role performance pattern scale (RPPS) was developed on the basis of the above to study the patterns of role performance of role incumbent.

The following hypotheses were developed and tested :

When exposed to the role conflict situations

(a) Headmasters, experiencing high role conflict will perform their roles more to seek compromise between the conflicting expectations than full conformity to one set of the incompatible expectations or complete avoidance of the conflicting expectations.

(b) Headmasters, experiencing low role conflict will tend to conform to one of the two conflicting expectations against the other, rather than compromising between them or avoiding the same.

(c) Headmasters, experiencing moderate role conflict will either conform to any of the two conflicting expectations or compromise between them or avoid the situation, thereby identifying their behaviour significantly with none of the three patterns—conformity, compromising and avoidance.

Procedure

On the basis of the exploratory work, which included the survey of the related literature and the experience survey through comprehensive interviews of 37 headmasters (stratified sampling) and 15 parents, 15 teachers, 15 students and two educational administrators (purposive-sampling), 100 pairs of attractive conflicting expectation items were selected and got rated on a five-point scale by 20 judges (purposive-sampling) resulting in the identification of 43 role-conflict situations The further screening led the investigator to identify the 19 potentially significant role-conflict situations.

The role conflict instrument was administered on 122 headmasters (random sampling), the 10 per cent of the population and using the percentile ranks, three groups of headmasters (five in each group) experiencing high, moderate and low role conflict, respectively, were identified for intensive study.

The data about the role performance of the selected three groups of the headmasters and headmistresses were collected with the help of role performance schedule (RPS) through on-the-spot observation, interviews and perusal of records. The data collected as such were examined with the help of the three dimensional RPPS for identifying the patterns of role performance in the selected 19 role conflict situations.

Findings

(a) *Role Performance of the Headmasters Experiencing High Role Conflict*

About the role performance of the headmasters experiencing high role conflict in the 19 potentially significant role conflict situations, the different patterns that emerged, with specifications against each, have been presented in Table 1.

TABLE 1

PATTERNS OF ROLE PERFORMANCE OF THE HEADMASTERS
EXPERIENCING HIGH ROLE CONFLICT

Role Performance		*Frequencies*	*Total Frequencies*
Dimension	*Patterns of Behaviour*		
CONFORMITY	Conforms to expectations dimension 'A'	8	27
	Conforms to expectations dimension 'B'	19	
COMPROMISING	Interprets rules to justify action.	4	49
	Discusses with the person/group to convince.	3	
	Takes action to prevent the occurrence of the situation.	20	
	Conforms partly to both the conflicting expectations.	22	
AVOIDANCE	Transfers authority/responsibility to take action interpreting rules.	5	
	Transfers authority/responsibility to evolve criterion for action.	9	
	Refers to rule/authority and becomes lenient and disinterested.	5	

Table 1 shows that the frequencies of the role performance of the headmasters in the compromising dimension of the behaviour in role conflict situations are the largest (51.6 per cent) followed by the frequencies in the conformity dimension of behaviour (28.4 per cent) and the avoidance dimension of behaviour (20 per cent).

The chi-square value of the frequencies, when computed, comes to 15.29, which with 2 degrees of freedom is found significant at .01 level of confidence. This implies that the divergence observed from expected results is too unlikely of occurrence to be accounted for solely by sampling fluctuations and hence there is significant trend of role performance in favour of the compromising dimension of role performance.

This verifies the hypothesis predicting the direction of role performance of headmasters experiencing high role conflict.

(b) Role performance of the Headmasters Experiencing Low Role Conflict

The frequencies of the various patterns of behaviour of the headmasters experiencing low role conflict have been given in Table 2.

TABLE 2

PATTERNS OF ROLE PERFORMANCE OF THE HEADMASTERS EXPERIENCING LOW ROLE CONFLICT

Role Performance		*Frequencies*	*Total Frequencies*
Dimension	*Patterns of Behaviour*		
CONFORMITY	Conforms to expectations dimension 'A'	23	60
	Conforms to expectations dimension 'B'	37	
COMPROMISING	Interprets rules to justify action.		24
	Discusses with person/group to convince	2	
	Takes action to prevent the occurrence of the situation.	6	
	Conforms partly to both the conflicting expectation .	16	
AVOIDANCE	Transfers authority/responsibility to take action interpreting rules.	3	11
	Transfers authority/responsibility to evolve criterion for action.	4	
	Refers to rule/authority and becomes lenient and disinterested.	4	

The data indicate that the role performance of the headmasters is mainly of conformity nature, as they conform one or the other set of expectations (frequencies are 63.1 per cent of the total). Such sort of his behaviour in the role conflict situations is followed by the behaviour in the compromising and the avoidance dimensions, respectively.

The chi-square value of frequencies comes to 40.5, which with 2 degrees of freedom is found to be significant at .01 level of confidence. Hence it can be safely concluded that in the role conflict situations, the headmasters experiencing low role conflict tend to conform to one set of expectations against the other set. This verifies the relevant hypothesis.

(c) *Role Performance of the Headmasters Experiencing Moderate Role Conflict*

In the 19 potentially significant role conflict situations, the role performance of the headmasters, who experienced moderate role conflict, is shown in Table 3.

TABLE 3

PATTERNS OF ROLE PERFORMANCE OF THE HEADMASTERS EXPERIENCING MODERATE ROLE CONFLICT

Role Performance		*Frequencies*	*Total Frequencies*
Dimension	*Patterns of Behaviour*		
CONFORMITY	Conforms to expectations dimension 'A'.	22	48
	Conforms to expectations dimension 'B'	26	
COMPROMISING	Interprets rules to justify action	1	25
	Discusses with person/group to convince	2	
	Takes action to prevent the occurrence of the situation.	6	
	Conforms partly to both the conflicting expectations.	16	
AVOIDANCE	Transfers authority/responsibility to take action interpreting rules.	7	22
	Transfers authority/responsibility to evolve criterion for action.	10	
	Refers to rule/authority and becomes lenient and disinterested.	5	

The data in Table 3 show that in the role conflict situations the frequencies in the conformity dimension of the behaviour of the headmaster experiencing moderate role conflict are the largest (50.5 per cent) followed by the frequencies in the compromising dimension of behaviour

(26.3 per cent) and those in the avoidance dimension of behaviour (23.2 per cent).

The chi-square value of the frequencies come to be 12.7, which with 2 degrees of freedom was found to be significant at .01 level of confidence, implying that the headmasters expriencing moderate role conflict also tend to conform to one af the two conflicting expectations against the other rather than compromising between the two or avoiding the situations.

This does not verify the hypothesis and the relevant hypothesis needs to be modified in the light of the above results. It can't be predicted that the headmasters experiencing moderate role conflict identify their behaviour significantly with none of the three patterns; on the other hand, like those who experience low role conflict, they also conform to one of the two conflicting expectations against the other

Conclusion

The facts about the role performance of the three groups of headmasters, experiencing high, moderate and low role conflict, when exposed to the role conflict situations indicate that the headmasters experiencing high role conflict tend to perform their roles more to seek compromise between the conflicting expectations than full conformity to or complete avoidance of the conflicting expectations. The modes of such behaviour of these headmasters include efforts to conform partly to both the conflicting expectations, attempts of preventing the situations by taking constructive measures, discussions with the persons or groups who have unacceptable expectations and exert pressures and sometimes the headmasters rationalize to justify their action which, they think, is against the perceived expectations of the influential counter position incumbents. In nutshell, their behaviour is characterized by the efforts to avert conflict with the counter position incumbents through constructive action.

The headmasters experiencing moderate role conflict were found to be conforming to one set of expectations against the other, when exposed to role conflict situations This fact was found against the hypothesis which stated that their role performance will be identified significantly with none of the three patterns—conformity, compromising and avoidance. This implies that the role performance of the headmasters experiencing moderate role conflict is of the same nature as that of those who experience low role conflict, since it was found, as hypothesized, that the headmasters experiencing low role conflict tend to conform to one of the two conflicting expectations against the other rather than compromise between them or avoid the same.

It may be interpreted, as such, that the headmasters experiencing high role conflict, being confronted with tension caused by the perceived expectations, try to escape the same through various constructive measures, but the headmasters experiencing moderate or low role conflict, conform to one set of expectations against the other.

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Koppitz Emotional Indicators on Human Figure Drawings of Indian Children

An Exploratory Study

PRAMILA PHATAK

REVIEWS OF STUDIES of children's drawings from time to time (Goodenough, Harris) record multiphasic approaches as follows :

1. Drawings as spontaneous activity
2. Children's drawings and prehistoric art
3. Drawings and aesthetics—artistic talent
4. Drawings as measures of intelligence and maturity
5. Drawings as expression of concepts
6. Drawings as means of communication and development of writing script-language
7. Drawings as self-expression, communication and projection.

Out of all these aspects of study the assessment of intelligence or maturity through drawings and drawings as self-projection, especially human figure drawings have appealed to psychologists both theory-oriented and practice (clinical) oriented. In fact, as back as 1926, when Goodenough published her analytical study of human figure drawings as a tool of measurement of intelligence she suggested the possibility of interpreting children's drawings in studying personality and attempted to associate qualitative features in children's drawings with certain personality types, e.g. bizarre features in children's drawings appeared to be associated with behaviour idiosyncrasies (Goodenough 1926). Harris (1963, p.24) has also noted some earlier suggestions about personality expressions through drawings.

The period following Goodenough's publication in 1926 on the human figure drawings by children it became one of the widely used techniques in child study. However, it seems that the workers in the field got grouped into two camps—one group got confined to the use of human figure drawings as measurement of intelligence and maturity (Goodenough, Harris), the other group confined itself to the study of human figure drawings as projective technique (Machover, Hammer, Jolles) The first group ignored the clinical signs noted by the second group considering them as of doubtful value. Moreover, the studies of the second group lacked the objectivity and comparability for their findings. In our country as far as the present author is aware of there is more work published on children's human figure drawings as test of intelligence than as self-projection (Phatak, Misra).

Koppitz (1968) attempted to study the developmental and clinical status of a child through the same human figure drawing he has made. She has located two sets of scoring items on human figure drawings for the two evaluations. One set of 30 items described as 'developmental items' are scored in terms of 'expected' and 'exceptional' items as observed in each age-group of her normative samples of boys and girls of ages 5-12 years The development scores are broadly classified into eight categories indicating the levels of mental ability ranging from high average and superior to mental retardation, functional and emotional disturbance. (Koppitz 1968,p.331). The other set of 30 items are described as emotional indicators. They do not show developmental trend related to age. They are comparatively of rare occurrence (15 per cent less) and have shown relationship with the mental state of emotional disturbance of the child. Some of these items are significant from different ages for boys and girls (Koppitz 1968,pp.331-33).

It has been noted that draw-a-man test is a quick measure of intelligence and hence can be used when a quick but an objective judgement is needed for further study of the child. The situations where it can be conveniently used refer to the location of children who need some individual attention for their educational programme (Phatak 1966,p.51). If the same human figure drawing (HFD) can give insight into the child's mental state of emotional disturbance it would be undoubtedly an asset in locating children who not only need attention for their educational progress but also for adjustment Locating needy children at an early age cannot be under-rated for better organization for proper education and development of children. With the intention of developing such a facility in using human figure are drawings of Indian children, an exploratory study of 'developmental items', and 'emotional indicators' noted by Koppitz on figures drawn by Indian children was undertaken by an M Sc student as a partial fulfilment of her course under the guidance of the author*. The present paper is based upon her work with 'emotional indicators'. The objectives of this paper are :

1. To study the incidence of Emotional Indicators (EI) on HFDs of Indian children
2. To explore the validity and reliability of the emotional indicators as noted in Indian sample.

Sample for Study

The total sample of drawings of 368 children was collected at three stages of work, namely, (i) pre-pilot study, (ii) pilot study, and (iii) the major study. As the objective of the study was to explore the applicability of Koppitz EIs to HFDs of Indian children the sample was confined to the University Experimental School to start with and was supplemented from two other schools, namely, Rosary School and the Baroda High School for completing the required sample for the major study. All the three schools for which the sample for present study was drawn are of high standing amongst Baroda schools for their performance. Table 1 gives the detailed classification of the sample according to the study, the school, the age and the sex of the children. Koppitz (1968, pp.6-7) instructions were followed, as far as possible, in administering the test.

TABLE 1

CLASSIFIED SAMPLE

			Age-groups												
Study	*N*	*School*	*7*		*8*		*9*		*0*		*11*		*12*		*Total*
			B	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B*	*G*	*B & G*
Pre-pilot	28	Not specific									7	7	7	7	28
Pilot	40	Not specific					10	10	10	10					40
Major	300	Univ.Exptl.	25	20	17	13	24	5	16	13	18	13	20	14	198
		Rosary School		5	8	12	1	11	9	5	7	4	5	3	70
		Baroda High School						9		7		8		8	32
			25	25	25	25	25	25	25	25	25	25	25	25	300
Total	368		25	25	25	25	35	35	35	35	32	32	32	32	368

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*The author is thankful to Km. Nalini Jinsi, the student, who clarified her querries about her analysis presented in her dissertation when she was working on this paper. Without her cooperation the paper was not possible.

Incidence of EIs

All drawings were checked for emotional indicators following Koppitz directions for doing so (pp. 331-334). Drawings were then classified in terms of number of EIs on each one of them. As the percentage of HFDs with EIs was more than 50 per cent in the major sample they were further classified according to the number of EIs and the percentages of each category in the total HFDs with EIs were calculated. The HFDs with EIs were also re-classified according to the ages of the children. Tables 2 and 3 give the details

TABLE 2

FREQUENCY AND PERCENTAGE OF HFDs WITH EIs

Study	*N*	*HFDs with EIs 'f'*	*%**	*No. of EIs* 1	2	3	4	5
Pre-pilot	28	4	14	—	2	1	—	1
Pilot	40	14	35	6	8	—	—	
Major-Study	300	161	54	83 52%	50 31%	23 14%	3 2%	2 1%
Total	368	179	49	89 50%	60 34%	24 13%	3 1%	3 1%

* Percentages are rounded

TABLE 3

HFDs WITH EIs IN EACH AGE-GROUP OF MAJOR SAMPLE

Age (Years)	*HFDs with 'f'*	*EIs% (rounded)*
7	32	64
8	27	54
9	26	52
10	29	58
11	25	50
12	22	44

The study of Tables 2 and 3 indicates that during the age range under study only the two extreme age-groups suggest the trend of decrease in HFDs with EIs as the age increases Another important observation is that one emotional indicator is common and the number of children having three or more EIs on their HFDs is very small. It is highly possible that dignostic value of more EIs on the same HFD might be greater than 1 EI. However, the significant number of EIs as related to diagnosis of emotional disturbance needed further exploration. This may be indicated by reliability of EIs.

Number of EIs on One HFD Significant for Diagnosing Behaviour Difficulty

Teachers of children having EIs on their HFDs were asked to rate the child on a five-point scale for difficulty in general management and social behaviour. Ratings for 138 children could be collected. Children were classified into 'having no difficulty' and 'difficult children' either in one of the two areas or in both the areas. Children with difficulty were further classified according to the number of EIs on their HFDs. Their percentages in the total number of children with specific number of EIs were also calculated. Tables 4 and 5 give the relevant figures.

TABLE 4

CLASSIFICATION OF DIFFICULT CHILDREN ACCORDING TO EIs ON THEIR HFDs

No. of	*No. of Difficult children*				*No difficulty*
EIs	*Difft. in Manage.*	*Difft. in Soc. beh.*	*Difft. in both*	*Total*	
1EI	10	3	5	18	
2EIs	8	1	5	14	
3EIs or more	7	2	9	18	
Total	25	6	19	50	88

TABLE 5

PERCENTAGE OF CHILDREN HAVING DIFFICULTIES IN GROUPS OF HFDs WITH DIFFERENT NUMBER OF EIs

No. of	*N*	*Children with difficulty*	
EIs	*(Major Study)*	— *'f'*	*% (rounded)*
1	83	18	22
2	50	14	28
3 or more	28	18	64

The figures in Tables 4 and 5 indicate that three or more EIs on an HFD have better diagnostic value than a single EI. This is both in terms of

TABLE 6

ANALYSIS OF NINE CASES ACCORDING TO NUMBER OF EIs ON THE HFD AND THE REPORTED BEHAVIOUR PROBLEMS

Case	*No. of EIs*	*Reported Problems*	
		by parents	*by teachers*
C	2	Overly sensitive, does not do school work, coaxing required, careless about school work, shy	Does not do the assigned work, often untidy, anger ourbursts, sometimes destructive, fidgets, quarrels and cries, teases other boys, shy in answering questions
F	4	Persistently bites nails, very placid and shy, jealous, tense when others are praised and withdraws, coaxing to do home work	Poor at studies, very shy in answering questions
G	3	Nil	Nil
B	4	Anger outburst, does not do school work	Many management difficulties, often shy, untidy in study, noisy, disturbs class, forgets to bring home work, teases others, quarrels, critical of others, unpunctual, poor manners, tells lies, fools around, anger outbursts, bosses over others, otherwise avoids playing, often fidgets and destructive.
D	4	Specially attached to her, needs her presence while eating, otherwise troublesome and fussy, difficult to discipline because of grandfather, very destructive, selfish, quarrels, fearful of darkness, negativistic, argues stubbornly.	Not attentive in class, disturbs other children.
E	2	Suffered from myocitis, reffered to psychiatrist, dreams—pleasant and unpleasant, voracious beyond hunger, persistently bites nails.	Nil
A	5	Often restless, shows infantalism, aggressively independent, extreme shifts in mood, unpleasant dreams, irritable, argues stubbornly, placid, does not fight back when provoked.	Noisy, restless, cheats in class, critical of others, often anger outbursts.
H	5	Nil	Nil
I	5	Nil	Nil

incidence of emotionally disturbed (behaviour problems) children and the spread of areas for problem behaviour -difficulty in management and social behaviour. However, the possibility of one or two EIs being significant indicators cannot be denied

Another probe into this issue was made by interviewing the parents of all the five children having 4 and 5 EIs on their HFDs from the major sample and all the four children having EIs on their HFDs from the pre-pilot study, on the child's behaviour problems as noted by them. Unfortunately the inerviews could not be deep and thorough. The analysis of the nine cases with the number of EIs and the noted behaviour problems given in Table 6 tend to support the view that the number of EIs alone might not be all significant without studying the significance of validity of individual items.

Validity of Items

Frequency of occurrence of each item in each age-group was counted separately for boys and girls and their percentages were calculated. Each item was evaluated for its validity by applying Koppitz criteria for validity of items, namely, (i) the item is not primarily related to age and maturation and hence does not show a trend of increase in the occurrence as a result of increase in children's age, and (ii) the item is rare and unusual and hence occur on 15 per cent or less of total HFDs in all the age-groups. Besides the above mentioned two criteria the items showing decreasing trend of occurrence with increase in age were considered as valid from age in which the occurrence is noted at 15 per cent or less. The items occurring only in one or two age-groups at 15 per cent or less were also considered as valid irrespective of the age in which they occur Items not observed on any HFD were noted as having potential validity. Table 7 gives the 30 items as valid, not valid and potentially valid (see Appendix 1.)

TABLE 7

EIs CLASSIFIED ACCORDING TO THEIR VALIDITY

Ref. sample	*No. of Valid items*			*Potentially not occurred*	*Not Valid*
	Ref. ages				
	7-12	*8-12*	*9-12*		
Boys	10	3	—	7	10
Girls	11	2	2	10	5
Both	5	2	—	7	3

A glance through Table 7 shows that out of 30 items only three are not valid on the total sample as well as sub-samples. Out of the remaining 27 items, 7 are valid, 7 have potential validity and the remaining 13 are valid either for boy's or girl's HFDs and some are valid for curtailed age range.

An attempt to further study the validity of items was done by having a critical look into the EIs observed on HFDs of the nine case studies noted in Table 6 The detailed analysis of items observed on 9 HFDs is given in Appendix 2. Table 8 gives the frequency of valid and not-valid items occurring on each HFD.

TABLE 8

ANALYSIS OF EIs ON HFDs OF CASE STUDIES ACCORDING TO VALIDITY

Cases		*EIs*		
	Valid	*Not-valid*	*potential*	*Total*
With problems				
A	1	4	—	5
B	2	2	—	4
C*	0	2		2
D	1	3	—	4
E*	0	2	—	2
F	4	0	—	4
No problems				
G*	2	1	—	3
H*	2	3	—	5
I	1	4	—	5

* Pre-pilot sample from University Experimental School

Observations in Table 8 do not tend to support a clear relationship between the occurrence of valid items or the number of items with reporting of behaviour problems and difficulty in management by parents and teachers As the case studies were not deep and thorough it is difficult to draw any conclusion about the diagnostic superiority of the valid items or the number of items on the basis of these observations

Conclusions and Comments

The observations of the exploratory study may be summed up as follows.

Most of Koppitz EIs satisfy her criteria for validity for Indian sample of unselected children. One EI appeared on about half the HFDs but three or more than three EIs were rare. Majority of children having three or more EIs on their HFDs were rated by their teacher as having difficulty in management or both management and social behaviour. However, the significant number of EIs or significant EIs indicating emotional disturbance through behaviour problems could not be determined

The evidence of validity and reliability of Koppitz EIs for Indian children points out to the possibility of developing a set of significant items based upon HFDs of non-clinical and clinical cases Koppitz has finally selected the EIs by the results of a well organized comparative study of HFDs by 76 pairs of a clinical case and an 'outstanding all round' student with good social, emotional and academic adjustment according to their teachers (Koppitz 1968, pp. 39-41) Perhaps the EIs will have to be related to the developmental expression on the HFDs of children in ascending age-groups. Koppitz developmental items are single points. One may think of using similar pattern for preparing a set of developmental items to which the EIs be related

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Appendix 1

PERCENTAGE OF OCCURRENCE OF EACH EI IN EACH AGE GROUP OF BOYS AND GIRLS AND ITS VALIDITY ON INDIAN SAMPLE

(V=Valid) (NV=Not-valid) (NO=Not-occurred -- Potentially Valid)

Item description (Koppitz)	*'Sex'*	*Age-groups*						*Validity*
		7	*8*	*9*	*10*	*11*	*12*	
Quality signs								
1 Poor integration of parts of figure (B7 ; G6)	B	11	0	0	0	0	0	V
	G	0	0	0	0	0	0	NO
2 Shading of face	B	11	0	0	0	25	8	NV
	G	0	0	0	0	8	0	V
3 Shading of body and/or limbs (B9 ; G8)	B	0	0	0	13	25	8	NV
	G	0	0	0	0	8	0	V
4 Shading of hands and/or neck (B8 ; G7)	B	0	0	0	13	0	0	V
	G	0	0	0	0	8	11	V
5 Gross assymetry of limbs	B	6	6	20	13	8	23	NV
	G	15	11	9	0	8	11	V
6 Slanting figure, axis of figure tilted by 15° or more	B	35	39	26	7	17	15	NV
	G	31	22	9	8	15	11	V9
7 Tiny figure, two inches high or less	B	6	6	26	7	0	0	NV
	G	15	11	9	0	0	0	V
8 Big figure, nine inches or more in height (B&G8)	B	0	22	0	19	18	23	NV
	G	0	11	9	0	18	11	NV
9 Transparencies	B	22	17	33	40	25	15	NV
	G	15	0	9	23	23	44	NV
Special features								
10 Tiny head, head less than 1/10th of total figure in height	B	0	0	0	0	0	0	NO
	G	0	0	0	0	0	0	NO
11 Closed eyes, both eyes turned in or out	B	0	0	0	0	0	0	NO
	G	0	0	0	0	0	0	NO
12 Teeth	B	11	11	0	13	8	8	V
	G	8	0	9	31	31	0	NV
13 Short arms, arms not long enough to reach waistline	B	17	6	0	13	0	0	V8
	G	23	33	9	0	0	0	V9

Item description (Koppitz)	*Sex*	*Age groups*						*Validity*
		7	8	9	10	11	12	
14 Long arms, arms long enough to reach knees	B	[illegible]	0		0	[illegible]	0	V
	G	0	0	0	0	0	0	NO
15 Arms clinging to side of body	B	0	0	0	0	0	0	NO
	G	0	0	0	0	0	0	NO
16 Big hands, hands as large as face of figure	B	[illegible]	[illegible]	[illegible]	0	0	0	V
	G	[illegible]	0	[illegible]	[illegible]	0	0	V
17 Hands cut off, arms without hands or fingers (hidden hands not scored)	B	6	0	[illegible]	13	[illegible]	0	NV
	G	15	[illegible]	[illegible]	[illegible]	[illegible]	0	NV
18 Legs pressed together	B	6	[illegible]	[illegible]	0	0	0	V
	G	[illegible]	[illegible]	[illegible]	0	0	0	V
19 Genitals	B	0	0	0	0	0	0	NO
	G	0	0	0	0	0	0	NO
20 Monster or grotesque figure	B	11	[illegible]	0	0	0	[illegible]	NV
	G	[illegible]	0	0	0	0	0	V
21 Three or more figures spontaneously drawn	B	0	0	0	0	0	0	NO
	G	0	0	0	0	0	0	NO
22 Clouds, rain, snow	B	0	0	0	0	0	0	NO
	G	0	0	0	0	0	0	NO
Omissions								
23 No eyes	B	0	0	0	0	0	0	NO
	G	0	0	0	0	0	0	NO
24 No nose (B6 ; G5)	B	22	6	[illegible]	[illegible]	8	0	V8
	G	[illegible]	11	0	0	0	0	V8
25 No mouth	B	[illegible]	6	13	[illegible]	[illegible]	0	V8
	G	31	11	0	[illegible]	0	11	V8
26 No body	B	6	0	0	0	0	0	V
	G	0	6	0	0	0	0	V
27 No arms (B6 ; G5)	B	6	6	0	13	0	0	V
	G	15	11	9	0	0	0	V
28 No legs	B	0	6	0	0	0	0	V
	G	0	0	0	0	0	0	NO
29 No feet (B9 ; G7)	B	6	11	[illegible]	7	17	[illegible]	NV
	G	0	11	0	0	8	0	V
30 No neck (B10 ; G9)	B	0	0	0	13	0	0	V
	G	0	0	45	21	8	0	NV

Appendix 2

OBSERVED EIs ON HFDs OF NINE CASES AND THEIR VALIDITY

Item description	*Case*	*Sex*	*Age (yrs.)*	*Validity*	*% Occ (Maj Sam.)*	*Highest % Occurred (Maj. Sam.)*	*Age (Maj. Sam.)*
Omission of nose	A	B	7	NV	22	22	7
	B	B	7	NV	22	22	7
	F	G	8	V	11	31	7
	I	G	7	NV	31	31	7
Omission of mouth	A	B	7	NV	17	17	7
	F	G	8	V	11	31	7
	I	G	7	NV	31	31	7
Shading of face	A	B	7	NV	11	25	11
Monster figure	A	B	7	NV	11	17	8
Big hands	A	B	7	V	6	7	9
Slanting figure	B	B	7	NV	35	39	8
	E	B	10	NV	7	39	8
	I	G	7	NV	31	31	7
Teeth	B	B	7	V	11	13	10
	G	G	10	NV	31	31	10 & 11
Poor integration of parts of figure	B	B	7	V	11	11	7
	H*	B	12	V	0*	11	7
Gross assymetry	C	B	12	NV	23	23	12
	F	G	8	V	11	15	7
	I	G	7	V	15	15	7
Transparencies	C	B	12	NV	15	40	10
	D	B	10	NV	40	40	10
Shading of limbs and/or body	D	B	10	NV	13	25	11
	G	G	1	V	0*	8	11
Shading of hands and or neck	D	B	10	V	13	13	10
	G	G	10	V	0*	11	12
Big figure	D	B	10	NV	19	23	12
	E	B	10	NV	19	23	12
	H	B	12	NV	23	23	12
Tiny figure	F	G	8	V	11	15	7
Omission of legs	H	B	12	V	0*	6	8
Omission of feet	H	B	12	NV	8	17	11
Hands cut off	H	B	12	NV	0*	32	9
Short arms	I	G	7	NV	23	33	8

*Case from a Pre-Pilot sample

□□

Adolescents with High and Low Creativity

A Comparative Study

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IT HAS BEEN emphasized by many theorists in recent years that creativity as a variable or a set of variables cannot be isolated from the totality of an individual's personality. In the words of Cattell, differences in creativity are more related to the cognitive traits and that personality and temperamental differences are more basic than the special ability factors in creative work. Consequently, some efforts have been made in the past two decades by various researchers to identify these personality and temperamental factors which can provide differentiation between groups with high and low creativity. Some of the factors which have been studied by researchers for this purpose are : curiosity, risk-taking, conformity, non-conformity, sense of humour, value orientations, extroversion, introversion, and neuroticism, cognitive styles, self perceptions, determination and ambition, timidity, bashfulness, motivation, independence and dogmatism, etc. (Palm 1959; Hammer 1961; Bhattacharya 1956, 1961, 1961; Weisberg and Springer 1961; Torrance 1959, 1961; Getzels and Jackson 1962; Stein 1962, 1963; Raychoudhary 1962, 1963, 1965, 1966; Parlof *et al.* 1968; Discipio 1965; Raina 1968; Schaefor, 1969; Mehdi and Ahmed 1969; Burke 1969; Hartfield 1969; Callister 1970; McHenry and Shouksmith 1970; Uhes and Shaver 1970; Paramesh 1970; Csikszenthmiyali and Getzels 1970; Holson 1967, 1968; Helson and Crutchfield 1970; Goyal 1969, 1972; Leith 1972; Cikszenthmiyalyi and Getzels 1973; Gakhar 1973; Paramesh and Laxmi 1973; Hasan and Ali 1973; Dutt *et al.* 1973; Mohini 1974; Gopal 1975; Gupta 1977). Nevertheless, as rightly observed by Freeman *et al.* (1971), such efforts being recent in origin, many more studies would be required to understand fully the role of personality and temperamental factors in creativity.

In the present investigation, four traits have been identified to see whether scores derived on them could differentiate significantly between adolescents with high and low creativity. These traits were taken from a list of 84 adjectives given by Torrance (1962) which are likely to differentiate between individuals with high and low creativity. However, little empirical published work is available in India atleast in which scores derived on these traits might have been utilized to differentiate between individuals with high and low creativity. On the other hand, we do come across several studies in which through the use of interviews, projective measures and personality word-lists, the above traits have been found to discriminate between groups with high and low creativity (Mackinon 1962, Stem 1963, Dauw 1965, Marino 1967, Kappas 1967, Smith 1967, Barron 1968, Parloff *et al.* 1968, Schaefer 1968, Akken 1968, Levin 1968, Gupta 1977).

Theoretical Foundation

According to Koestler (1967), in a creative activity, two or more configurations of thought intersect, juxtapose or compound and the resulting interactions may release emotions—euraka feeling, laughter, etc. Application of these feelings tends to convert a creative person into a 'humorist', a 'caricaturist' and a 'satirist'. Also, the pleasure, joy and satisfaction derived from the creative work often induce strength to rebel against external pressures, group norms, irrational authority which tend to stifle creative potentialities As a result, a creative individual becomes more or less, a non-conformist. According to Barron (1968), and Mackinon (1962), high creativity may be attributed to high emotional reactivity and exertability. Openmindedness and lack of social ease combined with an absence of commonly valued social virtues. Also, there is a tendency to free oneself from conventional constraints and inhibition. So there is a possibility among males to show feminine tendencies while females exhibit masculine tendencies Theoretically, therefore, it is possible to expect that groups with high and low creativity might differ with respect to their scores on humour, non-conformity, masculanity and femininity respectively.

In the present investigation, answers were sought to the following two questions :

1. Do adolescents with high and low creativity significantly differ with respect to their scores on sense of humour, conformity, femininity and masculanity ?
2. Is it possible to differentiate between the groups identified on the basis of their scores on verbal creativity and non-verbal creativity with respect to their scores on sense of humour, non-conformity, masculanity and femininity ?

Research Design

The sample for study consisted of 200 male adolescents who were drawn randomly from four Jammu high schools. The boys selected were studying in from grades seven to eleven and their ages ranged from 12 to 17 years, both years inclusive.

Data

Data regarding the following were collected.

a) *Creativity*

Data on both verbal and non-verbal creativity were collected. For this, the verbal and non-verbal batteries of MEIR Tests of Creativity were utilized. The verbal and non-verbal batteries of MEIR Tests of Creativity were developed and standardized by Gupta (1975). These batteries are in Hindi and are meant for use on boys and girls from 12 to 17 years of age. The batteries are of paper-pencil type which can be administered either individually or in groups. The verbal battery consists of seven sub-tests while the non-verbal battery consists of four sub-tests. The seven sub-tests included in the verbal battery are : (i) Signatures Test; (ii) Hypotheses Test; (iii) Naming Creatures Test; (iv) Coded Letter Test; (v) Polindromes Test; (vi) Word Transformation Test; and (vii) Exploration Test; which take 37 minutes for actual administration The non-verbal battery consists of four sub-tests, namely (i) Chair Completion Test; (ii) Figure Construction Test; (iii) Car Designing Test; and (iv) Bricks Drawing Test which take 20 minutes for actual administration. Scoring can be accomplished with the help of a pre-determined scoring guide and scores on 13 dimensions—five from the verbal battery and eight from the non-verbal battery—can be obtained on creativity dimensions, namely Fluency, Flexibility, Originality, Transformation and Creativity (from verbal battery) and Fluency, Flexibility, Originality, Complexity, Elaboration, Productive Designing Ability, Novelty and Creativity (from non-verbal battery), respectively. Also, a composite score for creativity can be obtained from both the verbal and non-verbal batteries. Evidence on test-retest reliability, inter-scorer reliability and intra-scorer reliability as also the evidence regarding content validity, concurrent validity and construct validity suggest that both verbal and non-verbal batteries are reliable and valid measures of creativity. Details of the batteries along with description of sub-test, etc. have been reported elsewhere (Gupta 1977).

On the basis of the scores obtained by the adolescents on the verbal and non-verbal batteries, pupils lying in the first and fourth quartile were identified and four groups were formed as follows:

Group I.	Pupils with high verbal creativity	(N=50)
Group II.	Pupils with low verbal creativity	(N=50)
Group III.	Pupils with high non-verbal creativity	(N=50)
Group IV.	Pupils with low non-verbal creativity	(N=50)

By adopting this procedure, it became feasible to restrict the study of the above variables to pupils with high and low creativity alone thereby partialling out the viciating influence, if any, of the pupils with average creativity, lying in the middle 50 per cent range as had been hinted at by Gupta (1977) in an earlier investigation. Thus groups representing two types of creativity (verbal and non-verbal) and two levels of creativity (high and low) were formed.

Sense of Humour

To measure sense of humour, Dialogue Test by Gupta (1975) was utilized. In this test, a situation is provided in the from of a conversation between two friends (the subject being one of these) in a railway compartment. The subject is required to imagine and write in the specified time (5 minutes) what one of the friends might have said which had made the subject laugh heartily. Responses to this test were rated on humour by seven judges on a seven-point humour scale. Numerical weights were assigned and these were added for seven judges to yield an index of humour.

Conformity

Scores on conformity were derived from the responses given by the subjects on one of the sub-tests in the non-verbal battery of MIER tests, namely, Car Designing Tests. The sketch of the car drawn by each subject was rated on conformity. Numerical weights assigned to these ratings were summed up to yield an index on conformity.

Masculanity/Femininity

Scores on these two dimensions were also derived from the responses given by the subjects on one of the sub-tests in the non-verbal battery of MIER tests of creativity (Figure Construction Test). In this sub-test, three geometrical shapes (a circle, a square and a triangle) are provided. Using twelve of these figures, the subject is required to construct a human figure. Atleast one geometrical shape of each type must be utilized by him in drawing the figure, in a given time The sketches of the human figure drawn by the subjects were rated by a panel of seven judges on a seven-point scale, first on masculanity and, on another occasion (after a time period of one month), on femininity. The two ratings were individually summed across and averaged for seven judges to provide indices on masculanity and femininity, respectively.

Treatment

The design of the study enabled the investigator to use a 2×2 ANOVA. technique on the lines of Edwards (1968). Four analyses had to be worked out, one each for the variables under study. The results are presented in the Tables

Discussion

From Table 2, it may be seen that the F-ratio for the rows (levels of creativity) is highly significant (F 15.386; $P<.01$). This implies that the highly creative pupils, irrespective of the type of creativity (verbal or non-verbal) have significantly higher scores on sense of humour as compared to the pupils with low creativity. Thus, there is evidence of more sense of humour in the pupils at higher level of creativity. The F-ratio for columns (types of creativity) is insignificant thereby suggesting that significant differences on sense of humour could not be observed in the groups (with high and low creativity) on verbal and non-verbal creativity. In other words, scores on sense of humour were unable to differentiate between verbal and non-verbal creativity at different levels of creativity. The F-ratio for the interaction between rows and columns (types and levels of creativity) is insignificant even though the value of F (3.556) just fails to reach the significance level by a small margin. This indicates that the possibility of interaction between types of creativity and levels of creativity *vis-a-vis* sense of humour may not be ruled out.

From Table 4, it may be seen that the F-ratio for rows (level of creativity) is highly significant ($P<.01$). This means that pupils with low creativity, irrespective of the type of creativity (verbal or non-verbal), have significantly higher means scores on conformity than the pupils with high creativity. Scores on conformity, therefore, have been found to discriminate significantly between the pupils with high and low creativity (whether verbal or non-verbal). On the other hand, the F-ratio for columns (types of creativity) is insignificant thereby indicating that differentiation between pupils with verbal and non-verbal creativity was not possible on the basis of the scores on *non-conformity* at *any level of* creativity (high or low). Similarly, the interaction between types and levels of creativity *vis-a-vis* conformity is insignificant.

Results

TABLE 1

MEANS SCORES ON DIFFERENT DIMENSIONS AND NUMBER OF SUBJECTS IN DIFFERENT CELLS

TYPES OF CREATIVITY

	Verbal			
Levels of High Creativity	N	= 50	N	= 50
	M (humour)	= 24.70	M (humour)	= 22.30
	M (conformity)	= 21.40	M (conformity)	= 20.90
	M (masculanity)	= 1.80	M (masculanity)	= 2.00
	M (femininity)	= 1.22	M (femininity)	= 1.52
Levels of Low Creativity	N	= 50	N	= 50
	M (humour)	= 17.00	M (humour)	= 19.60
	M (conformity)	= 18.60	M (conformity)	= 16.60
	M (femininity)	= 2.01	M (femininity)	= 1.52

TABLE 2

SUMMARY OF THE 2×2 ANOVA UTILIZING SCORES ON SENSE OF HUMOUR

Source	*S.S.*	*Df.*	*Variance*	*F-Ratio*
S.S.(rows)	1352.00	1	1352	15.386*
S.S.(columns)	.50	1	.50	0 006
S.S.(interaction)	312.50	1	312.50	3.556
S.S.(within cells)	17223	196	87.872	

* Significant beyond .01 level

TABLE 3

SUMMARY OF THE 2×2 ANOVA UTILIZING SCORES ON CONFORMITY

Source	*S.S.*	*Df.*	*Variance*	*F-Ratio*
S.S.(rows)	630.125	1	630.125	8.172*
S.S.(columns)	78.125	1	78.125	1.013
S.S.(interactions)	28.125	1	28.125	0.364
S.S.(within cells)	15111.500	196	77.099	

*Significant beyond .01 level

In Table 4, none of the three F-ratio computed by utilizing scores on masculanity is statistically significant. This means that the differentiation between pupils with high and low creativity (whether verbal or non-verbal) on the one hand, and between pupils (highly creative or low

TABLE 4

SUMMARY OF THE 2 × 2 ANOVA UTILIZING SCORES ON MASCULANITY

Source	*S.S.*	*Df.*	*Variance*	*F-Ratio*
S.S.(rows)	3.645	1	3.645	1.598
S.S.(columns)	3.125	1	3.125	1.370
S.S.(interaction)	045	1	.045	.019
S.S.(within cells)	47.067	196	2.280	

TABLE 5

SUMMARY OF THE 2 × 2 ANOVA UTILIZING SCORES ON FEMININITY

Source	*S.S.*	*Df.*	*Variance*	*F-Ratio*
S.S.(rows)	13.52	1	13.52	3 654*
S.S.(columns)	7.32	1	.32	.086
S.S.(interaction)	7.22	1	7.22	1.951
S.S.(within)	725.56	196	3.70	

*Value approaching 05 level

creative) on verbal or non-verbal creativity, on the other hand, cannot be made on the basis of the scores on masculanity The interaction between types of creativity and levels of creativity is also insignificant.

On femininity scores (Table 5), however, we find that F-ratio computed for the rows (levels of creativity) is almost significant at .05 level even though the actual value fails to reach the .05 level by a margin of .20. Taking the trends of the results as symptomatic, it may be said that there is possibility of the highly creative adolescents (both on verbal and non-verbal creativity) to score lower on 'femininity' as compared to their counterparts with low creativity. The other two F-ratios are insignificant. This indicates that the scores on femininity are unable to provide significant discrimination between pupils (high or low) on verbal and non-verbal creativity. Also, the interaction between the levels and types of creativity on femininity is not significant.

Conclusions

The following conclusions may be drawn from the present study.

1. Adolescents with high creativity (both verbal and non-verbal) have been found to excel adolescents with low creativity (both verbal and non-verbal) on sense of humour. Further, there is

evidence to show that the former group is most likely to exhibit lesser 'femininity' than the latter group, irrespective of the basis of their identification (verbal or non-verbal creativity).

2 Adolescents with low creativity (both verbal and non-verbal) have significantly higher mean score on conformity as compared to their counterparts with high creativity. This shows that lower the creativity level, the higher is conformity.

3. Scores on sense of humour, conformity, masculanity and femininity were found to be inadequate to provide adequate differentiation between pupils high and low on verbal and non-verbal creativity. In other words, types of creativity cannot be discriminated on the basis of the above scores

Epilogue

The results obtained in the present study provide a convincing empirical evidence on some traits which might discriminate between groups of pupils with high and low creativity on the one hand and pupils identified on the basis of their scores on verbal and non-verbal creativity on the other. The present results are in line with the results obtained earlier by various investigators using a variety of measuring instruments and techniques and on different samples. Mackinnon, *et al.* 1962; Torrance 1962; Dauw 1965; Smith 1967, Akken 1968; Levine 1968; Parloff, *et al.* 1968; Marino 1968; Csikszenthmihaly and Getzels 1973; Gupta 1977. Nevertheless, it may be pointed out that the present investigation makes a significant departure from the above studies in that an effort has been made to quantity estimates on sense of humour, conformity and masculanity and femininity unlike many earlier studies in which inferential approaches were followed.

On femininity, however, the results obtained in the present study do not conform to the results expected on theoretical grounds. A possible explanation of this may be furnished by suggesting that the masculine or feminine tendencies among individuals with high and low creativity might be manifesting themselves at higher age levels. Such a trend was observed by Gupta (1977) who, in his study of the age-wise development of self-images of the creative boys and girls had found that the adjectives 'feminine' and 'masculine' were checked out by the groups at higher age levels. A possible reason for this is that adolescence being a period of emerging selfhood (Dinkmeyer 1965), there is a desecrate tendency on the part of boys and girls to identify themselves with the image of adult males and females,respectively, towards which they are gradually growing

The fact that the results obtained in the present study broadly fall in line with the results which may be expected on theoretical grounds, can be taken as a satisfactory evidence of the validity of the newly developed verbal and non-verbal batteries of MIER tests of creativity. On the basis of the results obtained in the present study and the results reported by other researchers, it may be suggested that sense of humour, conformity seem to be adequate differentiating variables between the groups with high and low creativity at adolescent and adult levels As such, these could be utilized as reliable predictor variables in creativity studies.

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Success in the High School Examination

Prognostic Importance of Delta Level Subjects

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In the day-to-day teaching as long as the pattern of examination remains as it is, the prognostic value of various subjects at the delta level should be known to the teachers concerned so that they may use this scientific information to step up their percentage of results and avoid wastage at the higher level by arresting the impending risk about two years earlier. Assuming for the purposes of the present study that the high school success is the adequate criterion, the problem is to see how far the accomplishment in one particular subject in Class VIII taken by itself or a combination of subjects taken together can give the prognosis of high school success.

IN THE AREA OF EDUCATION prediction plays an important role. With the help of statistical studies, we try to foretell the occurrence of certain phenomena to a certain degree. Thus we are in a position to make prediction of 'how much' of a thing will happen under conditions we know and have measured. For example, we can predict, to a great extent, the probable grade a student will earn in English, if we know his or her score in a general scholastic ability test score in a special aptitude English test and perhaps his or her devotion to the subject. Similarly, knowing the relationship between school marks of the sampled students in a certain subject at a particular level and their results at a higher stage, we can assess the predictive value of that subject for success in the higher examination.

The sooner the predictive value of different subjects is established the better it will be for the educationists, psychologists, teachers, examiners and curriculum-makers. With this end in view, the present paper attempts to analyse the problem of prognostic importance of delta level subjects for success in the high school examination.

In our system of education, the role of the delta class is of paramount importance. It has been justly adjudged as the watershed between primary and secondary, because it has to be used as an exploratory year for locating the special aptitude and inclinations of each pupil Apart from it, the education that we impart at this level is supposed to fall in line with that obtained at the high school level. The subjects in which a student fares well at the delta class are expected to foretell his success atleast in those subjects in the high school examination. And as such educational preparation at this level has to pave the way for further success at the higher level.

In the day-to-day teaching, as long as the pattern of examination remains as it is, the prognostic value of various subjects at the delta level should be known to the teachers concerned so that they may use this scientific information to step up their percentage of results and avoid wastage at the higher level by arresting the impending risk about two years earlier. Thus the present study is designed to answer the following questions :

1. Is there any correlation between the obtained marks in a certain subject at the delta level and success in the high school examination ?
2. Is the correlation positive or negative ?
3 What are the comparative correlations between the delta level subjects and success in the high school examination ?
4. Which combination of subjects of different groups at the delta level can give the best possible prediction.
5. What are the underlying factors that affect the prognostic value of different subjects at the delta level ?

Design of the Study

The Sample

As it is evident from the topic that the present study is mainly concerned with the students of delta level and high school and, therefore, the sample of this study pervades these two levels. Regarding years, it must be mentioned here that since the author aimed at judging the prognostic value of different subjects at delta level for success in the high school examination, he had to collect marks obtained by the students in the delta class examination for the year 1973 in different subjects and to take into account the success or failure of the same batch of students at the high school level after two years, i.e. in 1975. In all, 140 cases could be traced out at the high school stage out of 350 students covered at the delta level. This sample was drawn from five intermediate colleges of Rae Bareli district.

Tools

As the author's problem was only to assess the prognostic importance of different subjects at the delta level for success in the high school examination only, he did not stand in need of any test. The author did not aim at making predictions about students' success at the high school examination but he tried to discover the prospects of students' success at the high school examination by examining a set of subjects at the delta level. Therefore, the only data which serve the purpose of tools in this study, are as follows :

(i) Delta level marks in various subjects of all the students selected for this study.

(ii) An account of their success or failure in the High School Examination after two years.

Techniques

The following are the techniques used in this study :

(i) Coefficient of correlation (Biserial coefficient of correlation).

(ii) Multiple correlation (Formula taught by Dr. S. N. Mehrotra, Director of Education, Uttar Pradesh).

Limitations of the Study

(i) As the essay type of examinations which are mostly prevalent in our country, do not furnish a perfect and very accurate standard of judgement for the abilities of students and very often admit of chance element, no authoritative and final inference can be drawn from them. Due to changes brought about in mental, physical, social and other aspects of an individual's life, his capacities of attainment are also changed. He may become better or worse according to the varying situations in his life Hence, the conclusion emerging from the data gathered for the present study is acknowledged very humbly to be tentative.

(ii) The sample taken for this study contains only 140 cases In the limited time available to the author, it could not be possible to have a larger sample for the study which would have no doubt, significantly raised the reliability of findings Similarly, had the procedure of random sampling been adopted, the results would have improved.

(iii) As different schools followed different methods for determining the maximum marks for each subject at the delta level, there was no way out except to convert all the marks into percentages to use them in uniform scores for computing coefficient of correlation. Hence the limitations of such a procedure have their impact on this study

Treatment of the Data

The author treated the delta level marks in various subjects as one variable and success or failure, in terms of 'passed' or 'failed' in the high school examination, as the other variable. Then the next step was to compute the coefficient of correlation between the delta level subject-wise school marks and the results of the high school examination, to find out the prognostic value of different subjects at the delta level for the success in the high school examination. The author's problem admits of the application of Biserial coefficient of correlation because in that problem the obtained marks of the students in various subjects at the delta level form one variable and their success or failure in the high school stands for dichotomous variable. And thus by computing the correlation by this method the relationship between the marks in various subjects and success in the high school examination can be measured. Hence the author used Biserial coefficient of correlation by the following formula ·

$$\frac{mp-mq}{\sigma}\times\frac{pq}{z}$$

Before any final judgement could be made regarding the predictive value of different subjects, it was considered adequate to examine the significance of the correlations. The question is how likely are we to get the same bis-r, if we repeat the study with another group of the same size, chosen in the same way ? The reliability of a coefficient of correlation depends upon the size of the obtained bis-r and the size of the sample. As such for judging the reliability of bis-r the standard error of each correlation was computed by the following formula :

$$\sigma\ \text{bis}=\frac{\sqrt{\dfrac{pq}{Z}}-\text{bis-r}}{\sqrt{N}}$$

In order to ensure which combination of tests tell a better prognosis, multiple correlation was computed by using the following formula, taught by Dr. S. N. Mehrotra, former Director, Bureau of Psychology, U.P., Allahabad.

$$r_m = \sqrt{1 - \frac{\Delta}{\Delta_{00}}}$$

Where Δ = whole determinant
Δ_{00} = The determinant left after deleting the criterion column and the criterion row

The delta level school subjects were combined in the following order: (i) English and Music, (ii) English and Agriculture, and (iii) English and Sanskrit

After computing the correlation between different subjects at the delta level and the criterion, it was decided to discover the correlation between the aggregate of marks at the delta level and the criterion. Therefore, Biserial method of correlation was again used and the correlation was established.

Interpretation of the Data

Any scheme of interpretation of the data involving statistical measures, like those of correlation and multiple correlation, should rightly begin with the accurate statements of facts regarding them to avoid ambiguity.

1. *Coefficient of correlation explained* : According to Garrett, "Perfect relationship is expressed by a coefficient of .00 Between these two limits, varying degrees of 'relation' are indicated by such coefficient as .33, or .92. A coefficient of correlation falling between .00. and 1.00 always implied some degree of positive association Relationship may be negative as well as positive; that is, a high degree of one trait may be associated with a low degree of another. When negative or inverse relationship is perfect, r = −1.00............Negative coefficient may range from—1.00 up to .00, just as positive coefficient may range from .00 to 1.00". Again Garrett says, "There is fairly good agreement among workers with psychological and educational tests that an

r from .00 to ± .20 denotes negligible relationship
r from ± .20 to ± .40 denotes low correlation; present but slight.
r from ± .40 to ± .70 denotes substantial or marked relationship.
r from ± .70 to ± 1.00 denotes high to very high relationship."

After having known the standard interpretation of various degrees of correlation, it seems desirable to give in tabular form various degrees of bi-serial coefficient of correlation, arrived at in the present study, between the delta marks in various subjects and the criterion, in order to have a vivid picture of the whole problem all at once

TABLE 1

r-BIS WITH σ r-BIS

S. No.	Subject	r-bis	σ r-bis	Interpretation
1	Agriculture	+.463	.227	Marked relationship
2	Sanskrit	.416	.134	Marked relationship
3	Music	+.254	.248	Positive but negligible
4	Home Science	+.216	.22	Positive but negligible
5	English	+.4	.095	Present but slight relationship
6	Hindi	.226	.105	Positive but negligible
7	Social Studies	+.2	.1	Positive but negligible
8	Commerce	+.157	.14	Positive but negligible
9	General Science	+.105	.108	Positive but negligible
10	Mathematics	+.085	.108	Positive but negligible
11	Art and Craft, etc	−.108	.225	Inverse but negligible
12	Urdu	−.417	.141	Inverse but marked relationship
r-bis between the aggregate +.22 of marks at the delta level and the criterion σ r-bis		.105		
Interpretation				Positive but negligible

2. *Multiple correlation and its interpretation :* Again, it would facilitate the reader to comprehend the outcome of the multiple correlation attempted in the present study, if presented in the tabular form as shown in Table 2.

TABLE 2

Subjects combined	*rm Individual r-bis with the criterion*	*rm*
English and Music	.4 .25	.445
English and Agriculture	.4 .463	.472
English and Sanskrit	.4 .416	.452

3. Subjectwise correlations and their interpretation :

(i) AGRICULTURE : The students offering agriculture in this study belong to S P N. Vidyapith, Tilor, which represents rural schools of the district. Most of the people residing in the neighbouring villages, from where the school draws its strength, depend solely on agriculture As the pupils belonging to such families are active participants in the job of agriculture at every morning and evening, before and after the school hours, they gain a thorough practical insight into the farming and hence they tend to show promising results in subject Moreover, these students are sturdy and painstaking by nature and as such they show better results in scholastic achievements, with the result that correlation between agriculture and the criterion is the best (.468) in the present study.

(ii) SANSKRIT : The nature of the subject has much to do with the memory and cramming power of the students Therefore, a student with good scholastic achievement in this subject explicitly reveals his fair chances of success in the next higher examination because as long as the essay type of examinations exist the importance of memory and cramming cannot be eliminated. And as such its correlation, as satisfactory as .416, shows the importance of the subject at the delta level for paving the way for success at the higher stages

(iii) ENGLISH : As known to all, it is a foreign language, the policy of Macaulay proved so powerful that this Language got its root stuck very deep in the hearts of a section of people of this country With the result that even after 29 years of freedom, the country could not do away with it completely. The amount of correlation is quite satisfactory which clearly indicates that a student who is at home in English at the delta level has better chances at the high school examination

(iv) MUSIC : It is a subject of special aptitude and interest and, therefore, only those students offer it who are inclined therein The course in theory at the delta level is limited and the practical examination pays much, as such the accomplishments in this subject should not affect the success or failure at the higher stage. The correlation arrived at, in this subject, being .254, also speaks in the favour of this statement

(v) HOME SCIENCE : Dealing largely with the domestic work, as it is taught and learnt in the school, it is not supposed to have much relationship with the overall scholastic achievements of the students on the academic level. Its correlation is .246.

(vi) HINDI : It is a compulsory subject. it is also used as mother tongue in the area chosen for this study. Therefore, without much efforts on the part of students, they succeed in fetching not only pass marks but also high marks in the subject. Whereas the success at the high school examination depends upon so many other factors, the marks obtained at the delta level in Hindi should not necessarily be related with the criterion.

(vii) Social Studies Its relationship with success at the higher stage, as hypothesized, should have been higher than what it is But because of the subjectivity of judgement in the examination, the expected results could not be arrived at.

(viii) Commerce : It requires practical social efficiency as well as motor ability which have to do very little in determining the success or failure at the later stages That is why the correlation found in this subject is negligible

(ix) General Science : The success or failure in this subject depends much on the scientific interest of the pupils. Therefore, accomplishment in this subject at the delta level may not determine overall success at the later stage where other elements become far more active than that

(x) Mathematics : Both intelligence and diligence are the requisite traits for proficiency in this subject and as such it is expected to have high relationship with the criterion. But the correlation being .085 speaks contrary to expectations The reason lies in the anomaly of courses at the delta level and high school stage

(xi) Art and Craft . As accomplishment in art and craft depends much on special interest and practical handling of things, they have very little capacity of determining one's success or failure at a higher stage

(xii) Urdu : It finds favour only with a microscopic minority, and that too for the simple reason that Urdu is the mother-tongue in its case. The handicap tells upon the results of the higher examinations where generally question papers are answered in Hindi. Consequently a high score in Urdu is a contra-indicative.

4. Aggregate at the delta level : The correlation is positive but negligible. The reason is obvious. The aggregate of marks is nothing but the sum total of the marks obtained in the various subjects and exposed to the danger of the negative factors of setting or cancelling the positive trend of correlation, thereby reducing the net correlation considerably.

5. Results of multiple correlation :

(i) English and Music : The result arrived at is satisfactory. r_m is higher than the correlation of either English or Music taken separately. It, therefore, establishes that in case of girls, marks of English and Music at the delta level when taken together, can give the best possible prognosis air for success in the high school examination.

(ii) ENGLISH AND AGRICULTURE The results arrived at show that there is some gain of a few points. Moreover, the multiple correlation being .445, excels the correlation of both the subjects individually.

(iii) ENGLISH AND SANSKRIT The degree of the correlation came to .452 which indicates that there is net gain of so many points compared with the scores of either English or Sanskrit taken separately.

Conclusions

(i) Most of the subjects at the delta level have positive correlation with the success in the high school examination but there are also some subjects like art and craft and Urdu which have negative correlation.

(ii) Agriculture is related to the criterion to the degree of (.463±.227), Sanskrit to the degree of (.416±.134), music to the degree of (.254±.248), home science to the degree of (.246±.22), English to the degree of (.4±.095), Hindi to the degree of (.226±.105), social studies to the degree of (.2±.1), commerce to the degree of (.157±.34), general science to the degree of (.105±.108), mathematics to the degree of (.085±.108), art and craft, etc. to the degree of (−.1108±.225) and Urdu to the degree of (−.417±.141).

(iii) Marked fluctuation in the standard of marking, small sampling, defects of the eassy type of examinations, directly or indirectly affect the prognostic importance of different subjects at the delta level.

(iv) Marked correlation between Sanskrit at the delta level and the criterion proves the fact that memory plays an important role in determining the success at the later stage.

(v) The fact, that only 40 per cent of pupils reach high school level after passing the delta class, throws light on the burning problem of stagnation and wastage in education.

(vi) English and agriculture when combined together give the maximum possible prediction of success in the high school examination.

Educational Implications

(i) The assessment of the prognostic importance of the delta level subjects for success in the high school examination may provide an insight to suggest ways and means to improve the practice of education for making learning and teaching more effective.

(ii) The knowledge of the prognostic value of the delta level subjects may help a teacher in stepping up his percentage of results and thus avoiding wastage at the higher level by arresting the impending risk about two years earlier

(iii) This study may prove to be of great help to the administrators of educational institutions. The moment they come to know that a particular subject, for example in the present study, English, gives better prediction, they may endeavour to arrange for better teaching in English in order to help students in their social adjustment and future success at the higher stages of academic levels

(iv) There ought to be uniform rules and regulations in all schools regarding promotion of students Similarly, uniformity in standard of marking as well as in the standard of teaching is essential.

Suggestions

(i) A study of similar design based on a larger size of sample be made in order to verify the findings of the present study.

(ii) Curriculum reconstruction, standardization of better techniques of prediction, preparation of a battery of delta level school subjects, are some of the areas in which researches should be undertaken

(iii) An investigation should be made to discover what weightage should be given to different subjects in the promotion examination at the delta level in order to attach more accuracy to the predictive value of school subjects. □□

Educational Research by Classroom Teachers

Emerging Trends

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The scheme of experimental project schools is in vogue for more than 20 years. More than five thousand teachers throughout the country have been benefited by this scheme. Reports of 60 completed experimental projects (1972-77) received through Extension Services Centres of the western region have been thoroughly studied by the author. There are 12 experimental, 40 developmental, four action researches, three surveys and one case study project. The subject area: language 11, library services 11, indiscipline 10, science teaching 6 testing and evaluation 6, teaching 3, social science 2, co-curricular activities 2 and in general 6. The present paper represents an emerging trend out of the researches conducted by the classroom teachers of the western region for the period 1972-77.

PROGRESSIVE educational institutions under good administrative leadership must continually evaluate student progress. This evaluation should result in an increased body of knowledge, concerning the ways in which people learn, what should be taught, and how to go about it. The old expression, "It was good enough for my father, so it's good enough for me", is no longer appropriate for a society in which the technological development of each day tends to make obsolete many of our previously established theories. We must constantly strive to obtain new truths in all phases of human existence, and to do so requires an educational system that progresses at least as rapidly as the world in which it operates.

Educational research appears to be the most likely method of keeping up with events in our present dynamic society. The outcome of this research should produce diversified benefits for educational processes, from the personal on-the-job improvement of an individual teacher to the establishment of an entirely new body of theory or thought. Problems to be studied are plentiful. Among the perennial educational problems for which no final answers have as yet been obtained are grouping for instructional purposes, selection and organization of curriculum content, interpersonal relationships among peer groups, development of the slow learner, utilization of the full abilities of gifted children, learning theory, teaching effectiveness and its evaluation, class size, methods of presentation and problems dealing with related areas such as school finance, facilities and community environments

The field of educational researches and innovations is vast. It becomes quite difficult and complicated activity for new investigator. One has to take a stock of situation of the specified area in which he is aiming or interested in. He is to judge his familiarity with terminology widely accepted and used by colleagues in reporting the findings of researches. It is advised further that while selecting area for research, one should also look to his level of knowledge, talent and ability which will permit him to make contribution to the field or to find out reasonable answer of his problem. The various areas which have been thoroughly investigated by educational researchers are intellectual development of pupils from different cultural background, curriculum development, teaching, sociological and economic conditions affecting education, educational administration and planning technology of education, problems and education of individual differences, techniques of education, etc. Under each of these broad categories there may be several problems which multiply further when variables related to them are taken into consideration.

At present our classroom teachers have not gone in all areas and problems investigated are also not many. For convenience common problems investigated by them are grouped into eight categories under 'Innovated Practices for Classroom Improvements'. All investigations under each category have been reviewed, common findings and conclusion recorded and comments given for the help of readers. These are :

1. Innovated practices for development of linguistic abilities (communication skills) amongst school pupils
2. Innovated practices for better achievements in school subjects
3. Comparative methodologies and pupils' attainments
4. Innovations in assessment, examinations and evaluation practices
5. Innovated practices for planning and systematically evaluated home assignments
6. Innovated practices for improving library services in schools

7. Innovated practices for improving bad habits among pupils
8. Innovated practices for general improvement of interest, attitude and skills of pupils

I. Innovated Practices for Development of Linguistic Abilities (Communication Skills amongst School Pupils)

Development of proper linguistic abilities (reading, writing; expressional and creative) amongst the elementary and secondary school-going students is one of the important aims of teaching languages—Hindi, English, Marathi, Gujarati, etc. Teaching of language is not limited to acquiring knowledge of the elements, but also includes reading with undersanding. Then only the child feels sensitive to environment and feels himself involved. This gives new dimension to the concept of teaching the language. It is very desirable for a language teacher to develop in children some skills and abilities which help them in learning to read. Principal investigators of the western region, five in Hindi, two in English, two in Marathi and one in Gujarati (see Appendix) have carried out the following experimental projects :

1. Developing a plan of removing common grammatical mistakes in Hindi sentence construction.
2. Improving reading habits of students through effective use of school library.
3. Developing a project in Hindi language teaching.
4. Adopting remedial measures for removing defects in Hindi language speaking amongst tribal students.
5. Adopting remedial measures for removing incorrect pronunciation in Hindi speaking.
6. Developing a plan to improve pupils' expression in English through directed self-study method.
7. Developing a plan to improve expressional ability of pupils in English.
8. Developing a plan to improve handwriting skill in Marathi language.
9. Developing a plan to speak Marathi correctly.
10. Developing a plan to improve spoken and written expression in Gujarati language.

Findings and Conclusions

For proper motivation of students

—Regular practice in correct writing and pronunciation in Hindi definitely brings about improvement in linguistic abilities.

- —The implications of continuing frequent incorrect and mispronounced usage of words, if explained in a proper way, help the students in developing proper language abilities.
- —Encouragement of students to participate in mutual discussions, recitations, competitions, make them conscious and they commit less mistakes.
- —Continuous evaluation procedure helps in the regular improvement of students.
- —Provision of opportunities for expression, listening of correct lessons/lectures and conscious reading helped the tribal students to correct their language skills.
- —Involvement of students in reading articles related to their interest helps developing proper reading habits.
- —If correction of mistakes is done in regular class period before the students, it helps improve removing mistakes in languages

Comments

Nobody can deny the importance of the use of correct reading, writing and expression in any language. It is mainly concerned with children who begin study of any language, hence the importance of the area for research. Teachers have made use of varied devices to know first the common mistakes committed by children and then adopt correct measures for very long time on groups of students. The common indicators ensuring the change are relatively less number of mistakes in each area of linguistic and communication abilities. These developmental studies/projects undertaken by teachers are very good, their findings are suggestive in nature and have covered Hindi, English, Gujarati and Marathi. More experimental researches in this area are needed. Use of tape-recorder, radio lessons and the language laboratory, at elementary level, are also recommended to improve linguistic abilities.

II. Innovated Practices for Better Achievements in School Subjects

Ever since the formalization of education, deliberate attempts have been made to appraise the effect of classroom instructions in terms of level of attainment/achievement made by individual. Achievement can be measured with the help of teacher-made or standardized tests. Teacher-made achievement tests must be prepared with sufficient care, taking into consideration the level of the students and objectives, teaching concepts/unit/topic/particular content. In general, a teacher-made test conducted at completion of unit of the curriculum are known as periodical tests.

It has also been observed that frequent use of periodical tests help in maintaining regular study habits and attentiveness of students in the class. Further, there is relationship between a periodical test and achievement of students. Achievement of classroom instructions has been of much concern for the practising teachers The following investigations, in diagnosing the reasons for lower achievement, suggesting remedial measures and effect of aids, other activities and periodical tests, on overall achievement of students, carried out by them are :

1. Diagnostic and remedial teaching in numerical physics for biology students.
2. Investigations into reasons of getting less marks in biology practicals.
3. Diagnosing the difficulties experienced by Class V students in learning arithmetic.
4. A study of the impact of diagnostic and remedial teaching of Class VIII students with low achievement in algebra
5. An investigation into improvement of achievement in geography through use of aids.
6. A study on the effects of periodical tests on achievement of students of Class IX in general science
7. A study on the effects of unit tests on achievements of Class VIII students in elementary mathematics
8. Development of a standardized achievement test in maths for Class VIII
9. A study on effect of periodical tests on achievement of Class IX students in English
10. A study into assessment of an impact of introducing periodical tests in economics.
11. A study of improvement in achievement of geography through survey of surroundings.
12. An effect to evolve techniques for better achievements for mediocre students.
13. An investigation into effectiveness of extra-curricular activities for improving achievement in new maths.

Findings and Conclusions

—In geography, frequent use of maps, statistical information in the form of base or circular graph, metrological equipments, practice for making maps helped in improving the achievement of students.

In teaching geography, frequent use of maps, bar and circular graphs, metrological instruments, practice of making maps, helped in improving the achievements of Class IX students

-In making survey of surroundings, urban students showed more interest than rural in studying geography.

-Frequent use of periodical tests developed confidence, interest in pursuance of the subject, encouraged them for regular study amongst the students of Class IX in general science.

—In mathematics for Class V, the problems on simple fractions, unitary methods, simple interest and areas were found to be the most difficult topics. To overcome these difficulties remedial steps suggested were: more stress on learning difficult concepts, parent-teacher cooperation and sufficient practice by students.

—Mediocre students in Class VIII showed marked improvement by frequent use of unit tests in elementary mathematics.

-Remedial teaching at the end of each unit test proved helpful for all students in their achievement of the annual examination.

The standardized achievement test prepared for Class VIII students was found useful in predicting students' suitability for higher mathematics courses.

-Frequent administration of tests after completion of each unit in Class IX, helped students in following regular study habits and pay more attention in the class.

—Results of using unit tests, group studies and oral tests, proved to be essential for academic school environment. It promises to solve many indiscipline problems.

—Supervised study method when properly accompanied by personal attention, helped the majority of mediocre students in improving academic performance and study habits in English in Class IX.

—The use of projected aids proved very useful in arousing the interest of students in new mathematics.

—Diagnostic testing and remedial teaching helped mediocre students in improvement of their academic achievement in Class VIII algebra.

—Details and systematic analysis of the reasons for low achievement in spotting activity in biology and planned remedial practice have helped in better achievement of Class IX students.

—Diagnostic and remedial teaching regarding trigonometric ratios, helped girls in better academic performance in the area of numerical physics.

Comments

This is an important area of research with which all subject teachers and students directly, and educational administrators and planners indirectly, are concerned. This area has been explored by teachers in greater breadth and depth. The researches, though all directed towards specific subjects, have extensively made use of varied tools, survey questionnaire, interview schedule, previous academic background to diagnose the reasons for low achievement and then suggesting the remedial measures. Mostly investigators have developed their own unit tests, but one developed as standardized achievement test in mathematics is worth attempting. In most cases experimental approach has been tried and statistics used proved the difference in achievement significant; but tests used are not standardized. The area is to be looked from this point of view.

III. Comparative Methodologies and Pupils' Attainments

Subject of inter and intra-comparison of one thing, trait/characteristic/variable, with the other is most familiar process known to the man. But the use of act of such comparison as a method in the educational measurement is an evidence of his effort or subject-matter learnt or any kind of experience provided to students over certain period of time. The best strategy to get an evidence of a result of particular treatment/training/environment, is to find out the difference in the educational standard of the students before and after the act of treatment. The science of comparative methodology sometimes requires subjects of this group to be made as equal as possible in most of the variables, while other methods require equality in treatment. Both ways, statisfactory results have been obtained.

Four different investgations in this area of comparative methodology have been carried out by classroom teachers. They are :

1. A comparative study of the efficiency of teaching spellings by dictation method and transcription method.
2. A comparative study of efficiency of assignment method with supervised method in teaching of Hindi.
3. A comparative study into the educational achievement of children studying in practice schools during practice teaching and normal teaching.
4. A comparative study of the effectiveness of laboratory method and demonstration method in science teaching.

Findings and Conclusions

- —Dictation method and transcription method proved to be equally effective as far as teaching of spellings to Class IX students is concerned.
- —Supervised and assignment methods of learning is superior than lecture method for pupils of Class VI in Hindi.
- —Students developed a habit of taking notes and using dictionary.
- —Elementary classes gained more in achievement during teaching practice time than during normal teaching.
- —Practice teaching mixed with normal teaching produced better achievement.
- —Demonstration method is as good as laboratory method for teaching science to lower classes.
- —Laboratory method is more suitable for a few topics while for others demonstration is better.

Comments

The researches and studies in this area have tried to make use of comparative methodology in classroom teaching, teaching practices in training college, laboratory and demonstration situation and impact of inservice programmes on resource personnel and their performance. The findings of these researches seem to be quite encouraging but detailed study shows that variables affecting the gain or achievement have not been considered carefully. Otherwise, the findings are quite beneficial and have long-range implications in improving classroom practices. Designing of experimental procedure and hypothesis drawn needs more specification. Tools other than teacher-made achievement tests and indicators other than classroom achievement are to be utilized to measure the success of comparative methodologies. Carefully designed learning experience in relation to relative outcomes measured with more valid and reliable tools would be a productive area for research.

IV. Innovations in Assessment, Examinations and Evaluation Practices

Lord Kelvin once said: When you can measure what you are speaking and express it in numbers, you know something about it. The full significance of this statement is embodied in the innumerable measuring devices and testing techniques currently in use for varied types of educational achievements. Academic achievement gained through interaction of variety of learning experiences with and by the pupils is of different nature than the achievement of any industry. In a classroon situation the teacher has to test every child by his level of academic achievement against a pre-assigned level. It is also clear to all of us that the entrants in classroom are definitely heterogenous in terms of socio-economic background, academic standard, aptitude, abilities to learn and levels of aspirations. But in practice we, in general, give same type of treatment which creates a number of psychological problems amongst individuals.

The purpose of evaluation of classroom achievement is not only classifying the individual into excellent, good, fair and poor categories as is usually done through public examinations, but the improvement of achievement and rather than its assessment Such effort will provide an insightful data about the areas of shortfalls and their possible causes. Such information will prove to be of constructive help in reaching the target in teaching and learning.

Our country cannot afford a highly selective process that frightens all but a few from schooling. Neither can it afford mass education process that holds all pupils to mediocre standards. A weak compromise has no place. Schools need standards that are broadly conceived and applicable to the great range of pupils in the schools. Recently there have been many improvements in the technique of assessing and evaluating the students' performances at school which are further supplemented by public examinations at state level and national competitive examinations. Given below are four investigations carried out by a classroom teacher in the area of evaluating classroom achievements through unit testing, objective type testing, etc.

1. A comparative study of essay and objective type examination system.
2. A study of unit testing in economics.
3. A study of introducing objective type questions and its impact over pupils' attainment in physics.
4. Development of creative expression through introduction of unit tests in H'ndi.

Findings and Conclusions

- In comparison to essay type examination, objective type testing proved more reliable.
- Objective based testing, being less subjective, proved to be more beneficial to pupils in mathematics.

- Objective based testing proved to be a more realistic way of evaluating pupils' assessment. On this basis one can identify the talent amongst pupils.
- Introduction of objective type items in unit tests resulted in positive attitude and interest towards study of physics in Class IX pupils.
- Unit tests in economics for the purpose of diagnosing deficiency areas in the subject proved useful in suggesting remedial measures to pupils of Class X.
- Unit tests proved to be beneficial for maintaining the continuity of students in study.

Comments

For more than two decades educational experts have been talking much about improvement of examination system. All efforts directly or indirectly related to this area are together clubbed as examination reform activities The scope of examination reform is very wide and it includes activities such as setting goals of examination, orientation of paper-setters, conducting examination (external as well as internal), essay type, objective type examination, etc. The teachers' performance is at stake if examination results are improved. Multiple choice, short answer, and very short answer questions are considered better. The subject has now become the field of research workers also. Teacher investigators through their research have also come to the conclusion that less number of essay type and more number of short answer and specific questions improve the validity of examination. Much research in this area is emerging and many more researches are yet to come out. This field is fertile for research.

V. Innovated Practices for Planning and Systematically Evaluated Home Assignments

Various meanings to the word 'assignment' have been given, e.g. setting out a specific physical or mental job for students, the work that has been allotted to the students, a period in the teaching-learning cycle, a really directed study, the part of the learning which extends learning beyond formal instructional situation or process.

The objectives of giving assignments are : to stimulate thinking, to encourage initiative, to clear misunderstanding, to develop an insight and understanding, to develop the ability to face challenges in similar or other related situations, to supplement classroom teaching-learning, to direct post-learning experiences and to inculcate the habit of self-learning amongst the individuals. The objectives or purposes of assignment determine the nature and characteristic and duration of the assignments. The chronological age, mental make-up, background experience and the purposes to be achieved in future are also determining factors to take a decision about any assignment.

No educational activity, i.e. teaching-learning in classroom may be considered complete unless an assignment is included in it. The investigations and the innovated practices carried out by classroom teachers regarding the assignment are as follows :

1. To study the home-work procedure in Class V of teaching practising school.
2. To study effects of assignments in teaching social studies in Class IX.
3. To study the impact of home assignment for Class IX students in physics.
4. To study the impact of planned home assignment on the achievement of students in physics.
5. To study the effect of assigning extra weightage to completed home assignment amongst the students of Class IX in economics.
6. To study the reasons for not completing home assignments in physics amongst Class IX students.

Findings and Conclusions

—The difficulties experienced by students under study in not completing the home assignment were weak academic background, no proper guidance in school and home and promotion policy in lower classes.

—Remedial measures suggested were completion of difficult portion of home-work in presence of teachers in school itself, clarity of subject-matter in class and to arouse the interest of parents in looking into home-work.

—Improving habits of completing home assignment regularly helps the students in better academic achievement.

—Well planned assignments help the students in better academic achievements and increase confidence in study.

—Limited amount of home assignment makes the teaching interesting and arouse confidence amongst students.

—Regular checking and limited home assignment according to the ability of students, develop positive attitude towards the study of the subject.

Comments

The investigators have explored this area very well, perhaps because they know its importance and its bearing upon the pupils' achievement. The subjects covered are from the areas of science and social studies in Classes IX and V. The methodology tried out varies from surveying of reasons for not completing home assignment through experimental treatment of single and parallel groups. Relevant elementary statistics have also been used. It appears that carefully planned and regularly checked home assignments in the school time itself proved to be beneficial. Before any generalization is drawn more studies on experimental design method in all school subjects is required. Secondly, sound and reasonable mechanism of parents' involvement is highly desirable. Planning and execution of longitudinal studies for particular ability of students in terms of their proper understanding of subject-matter will be highly beneficial.

VI. Innovative Practices for Improving Library Services in Schools

A good library comes next to a mother, a good teacher, a dear friend and the lovely world (nature) throughout the life of an individual. A good library service is an index of the whole academic excellence of any educational institution. It is a heart and pivot of all academic activities in any school. It is through the effective use of the library that an individual converts himself into a self-motivated, imaginative, creative and disciplined citizen—a scientist, leader, teacher, technician—and a permanent asset for the nation. In modern times, the library has a special role to play in achieving the objectives of teaching-learning process in the school. This requires the effective use of library by teachers and pupils both.

> In a large majority of schools, there are at present no libraries worth the name. The books are usually old, outdated, unsuitable, usually selected without reference to the students' tastes and interests.
>
> —SECONDARY EDUCATION COMMISSION

Realizing the growing need of good library services and continued disinterest of students towards the use of library books, enthusiastic teachers carried out the following related investigations to improve the use of library and library services.

1. An investigation to motivate the students for self-study through planned use of existing facilities of library by themselves.
2. An experimental study for making the use of school library more effective.
3. Survey of the reasons for less effective use of school library and then to suggest plan for better utilization
4. A plan to improve the reading habits of pupils through planned use of school library

Findings and Conclusions

—Directed study in the use of properly managed library proved effective in helping the better academic achievement of pupils in Hindi and an overall development of personality.

—Planned and organized way of library services motivated the pupils for self-study, helped in their academic achievement and literary co-curricular activities

—Non-availability of well classified literature, less number of interesting books, inappropriate and unscheduled time of issue for all students and disinterest of the incharge for its proper organization, lead to disinterest of pupils in using library as an instructional aid.

—Rural pupils coming from adjacent areas to attend school were not motivated to make use of library due to lack of time for study.

—Organization of book exhibition from library, twice a year, in the school, encouraged pupils to go to the library.

—Display of library books in unattractive manner, lack of trained librarian in school and non-availability of space for reading in the library did not encourage students for the library use.

—Consideration of library assignment equal to classroom teaching, by the teacher and suggestions for the proper use of library books, imbibe good habits of study and improvement in the knowledge amongst the pupils.

Comments

Researches in the area of effective organization of school library services have been limited mostly to the surveying of their reasons for ineffective organization, lack of interest of reading habits amongst students, number of books in each subject area and the general reading facilities. The sample chosen for studies vary from number of students (minimum 8) to the whole school population. The area of measurement of impact of available or created library and newspaper reading facilities in general and subject understanding (attainment of standard) seems to be the area so far neglected. Except one experimental study, all represent normal survey. Findings and conclusions are recommendatory in nature, hence the area yet remains to be explored in more systematic way, e.g. how various modes of imparting information about available books and physical facilities for improving subject attainment and reading habits.

VII. Innovated Practices for Improving Bad Habits among Pupils

Organization and execution of school activities have definite contribution to students' future life. Inculcation of good general and study habits, such as attending the school and school activities regularly, completing the assignment given by school, disposing democratic attitude amongst peer groups and respect to teachers, participation in co-curricular activities, etc. are the respnosibilities of the schooling system.

A student cannot develop the above qualities by remaining absent in classes, by leaving school before time, by coming late in the school, by avoiding participation in co-curricular activities, and by mass copying of home work and by performing many indisciplinary activities in the school. Development of such bad habits at the elementary stage are of serious concern to teachers. Therefore, investigators have carried out the following investigations in these areas :

1. Study of the causes of absence from school suggesting remedial measures amongst pupils of the elementary stage.
2. Identification of the causes of late coming of students and ways to improve it.
3. Study of habits of mass-copying and suggesting ways to remove it.
4. Identifying the causes of truancy and suggesting remedial measures.
5. Developing a plan to bring about improvement in the habit of leaving school before time.
6. Study of the causes of indiscipline amongst pupil-teachers of teacher training schools and suggesting remedial measures.
7. Studying the problem of absentees and its remedial measures.

Findings and Conclusions

—Proper emphasis on good healthy habits, pursuance through their parents, maintenance of cumulative records, periodic medical check-up as an integral part of school programme, arrangement of mid-day meals, not much involvement of pupils in domestic and social work, sympathetic behaviour of parents and teachers in removing their academic deficiencies, involvement of representatives of parents in school development committee, proper facilities to pupils and creation of attractive atmosphere of school environment, help the pupils in not remaining absent from schools.

—Periodical meetings/conferences of teachers with parents of students coming late, help to minimize the problem

—Fortnightly assessment of home-work, assigning marks and their weightage in annual examination, sympathetic consideration of students' difficulties, discourage them from mass-copying

—Frequent reporting of truants' weakness and asking them to come to school with parent, holding conferences, help to improve truancy in the school.

—Incompletion of home-work, attraction of cinema, lack of positive attitude towards manual work, lack of recreational facilities in schools, long distances of students' home from school, have been found to be the causes of leaving the schools before time.

—Organization of debates, dramas, encouragement of students towards *shramdan*, maintenance of cleanliness of the campus, games and plays, and sermons and preachings from great men, help to deviate students from inculcating bad habits.

—Authoritarian attitude of the principal and the hostel superintendent, undue protection of student-teachers by staff members, delay in action over pupil-teachers' problems by the principal, are the prime causes of indiscipline amongst students.

—Cordial relations between the principal and the staff, well qualified staff, timely action over problems and issues raised by pupil-teachers, proper attitude of staff towards pupils, help in minimizing the indiscipline amongst pupil-teachers.

—Proper analysis of the causes of absence of students from the school and adopting varied kind of remedial measures had good impact over students.

Comments

Researches related to indiscipline, truancy and absenteeism from subject classes and the school have been designated as bad practices amongst students. In most of them, reasons for the problems and their remedial measures have been surveyed with the help of questionnaires and their findings are recorded as recommendations. A few action researches have made use of these findings and observed the positive impact. Though, in every case, the sample chosen seems to be quite appropriate, but experimental approach has not been used in any one.

More researches pertaining to academic reasons for truancy and indiscipline could have been tried in place of enumerating them for remedial measures. The area needs further probe in this direction specially through carefully designed action researches.

VIII. Innovated Practices for General Improvement of Interest, Attitude and Skills of Pupils

> For students narrowly conceived bookish curriculum does not obviously provide the right kind of intellectual and physical activities, practical occupation and social experiences, which is not possible through mere study of books.
>
> — SECONDARY EDUCATION COMMISSION

The above quotation conceives more broader and modern concept of education which implies an all-round study and development of child, viz. physical, intellectual, emotional, social, recreational behaviour and enable him to discharge his duties as a better citizen to the best of his ability, attitude and interest. It is clear that the school must provide opportunities to pupils to develop the ability and aptitude required for a scientist-based sovereign democratic set up. This in part is achieved through effective organization of academic as well as co-academic activities through well constituted Students' Councils, literary clubs, social gatherings and pupils' participation in community development work. The investigators have conducted studies (diagnostic, remedial and developmental) which revealed certain findings related to the impact of certain co-curricular activities on academic as well as general abilities of pupils. These studies are :

1. To make school activities more effective through the Student Council.
2. To develop attitude towards labour amongst pupils.
3. A study of teaching Hindi through allied activities in studying geography.

4. A plan to develop interest amongst pupils throughout the school activities.
5. To study ways and means to enhance pupils' participation in co-curricular activities.
6. Developing a plan to develop good habits for better behaviour and noble character through Sanskrit Club activities
7. To study the causes of disinterest towards teaching profession amongst student-teachers.

Findings and Conclusions

—School activities proved to be more effective so far as truancy and attendance of the students are concerned. Regarding personality traits the investigation yielded that creativeness and cooperation fostered significantly through such programmes

—Organization of any work-experience programme in the school in close collaboration with persons from locality had positive effect upon pupils' attitude towards labour. Work-experience programme when mixed with other physical, literary and recreational activities developed positive attitude towards labour.

—Involvement in the allied activities after Hindi teaching helped the students in better academic interest.

—Investigation inspired the pupils for better behaviour, good manners towards their group and neighbours.

—It proved very difficult for the investigator to increase the interest of students from rural areas for more participation in co-curricular activities.

Comments

Due to reasons more than one in formal system of education, less emphasis is laid on the development of interest, attitude and skills in a particular subject and teaching profession as a whole. Investigation regarding the enhancement of pupil participation in co-curricular activities through Students' Council and houses and study of indifferent attitude of teachers about their profession, are somewhat better planned, rest of the researches are suffering in defining the problem, sampling, suggesting appropriate procedure to drawing conclusions. It appears to be more difficult and understood area for investigators. Future researches in this area be directed to develop learning experiences. More emphasis may be given to develop valid and reliable tools to measure developed interest, attitude and particular skills.

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APPENDIX

I. INNOVATED PRACTICES FOR DEVELOPMENT OF LINGUISTIC ABILITIES (COMMUNICATION SKILLS) AMONGST SCHOOL PUPILS

S. No.	*Name And Address of Investigator*	*Title of the Project*
1.	AMBAPKAR, R.S. Asstt. Teacher Vadgaon Vidyalaya Vadgaon (Kolhapur)	*Developing a plan to improve handwriting skill in Marathi language—standard V*
2.	BADAL, S.L. U.D.T., Govt. Hr. Sec. School Kirnapur (Balaghat) MP	*Developing a plan or removing common grammatical mistakes in Hindi sentence construction*
3.	DESAI, A.Y. Vikram High School Kolhapur (M.S.)	*Developing a plan to speak Marathi correctly*
4.	EMMANUAL, JAMES U.D.T., Govt. Hr. Sec. School Hatta (Balaghat) MP	*Improving reading habits of students through effective use of school library*
5.	JOSHI, P.D. and RAYANDE, H.A Asstt. Teacher M.G. Shah Didyamandir Bahubali, Tal : Hatkanaggale Kolhapur (MS)	*Developing a plan to improve expressional ability of pupils in English—standard IX*
6.	KUMAR, D.A. and JAIN, M.C. U.D.T. Govt. Hr. Sec. School Kunda (Jabalpur) MP	*Adopting remedial measures for removing defects in Hindi language speaking amongst tribal students of class IX*
7.	MAVADA, P.H. Asstt. Teacher Vinay Vidya Mandir Takarwada Tah : Palanpur Distt. Banaskantha (Guj.)	*Developing a plan to improve pupils' expression in English through directed self-study method in standard X*
8.	RAVAL, H.K. Navin Sarva Vidyalaya High School Vadnagar Distt : Mehsana (Guj.)	*Developing a plan to improve spoken and written expression in Gujarati language in standard IX*
9.	SAXENA, N.P. Sanik School Balachadi Jam Nagar (Guj.)	*Self-study project in Hindi*
10.	SHRIVASTAVA, G.P. Teacher Govt. Hr. Sec. School Kharlanji (Balaghat) MP	*Adopting remedial measures for removing incorrect pronunciation in Hindi speaking amongst class IX students*

II. INNOVATIVE PRACTICES FOR BETTER ACHIEVEMENTS IN SCHOOL SUBJECTS

Sl. No.	*Name and address of investigator*	*Title of the Project*
1.	CHODICHER, S.L. Lecturer, Municipal Makde M.P. Hr. Sec. School, Tumsar Bhandara (MS)	*An investigation into effectiveness of extra-curricular activities for improving achievement in maths*
2.	CHRISTIAN, V.J. Asstt. Teacher English Teaching School Vallabh Vidyanagar Kaira (Guj.)	*An effect to evolve techniques for better achievement for mediocre students*
3.	GUPTA, S.L. Lecturer Govt. Hr. Sec. School Balod, Distt. Durg (MP)	*Investigations into reasons of getting less marks in biology practicals*
4.	GREWAL AVINASH Lecturer Govt. Woman, B.T.I. Bhopal	*Diagnosing the difficulties experienced by class V students in learning arithmetic*
5.	HEAD MASTER Makhdum Hr. Sec. School Modasa (Sabarkantha) Guj.	*A study of the impact of diagnostic and remedial teaching of class VIII students with low achievement in algebra*
6.	KAPOOR, S.K. Lecturer Govt. Hr. Sec. School, Tirodi Balaghat (MP)	*A study on effect of periodical tests on achievement of class IX students in English*
7.	PATEL, C.B. V.N. High School, Dharmaj Kaira (Gujarat)	*A study on the effects of unit test on achievements of class VIII students in elementary mathematics*
8.	SINGH, N.B. Govt. Hr. Sec. School, Katori Distt. Balaghat (MP)	*An investigation into improvement of achievement in geography through use of aids*
9.	SHARMA, PRITAMLAL Lecturer, Govt. Boys Hr. Sec. School No. 2 Ratlam (MP)	*A study of improvement in achievement of geography through survey of surroundings*
10.	K.M. SEN., S. Lecturer MLB Girls Hr. Sec. School Jagdalpur (Bastar) MP	*Diagnostic and remedial teaching in numerical physics for biology students*
11.	SMT. SARLA, P.G. Maharani Chimanbai Girls M.H.S.M. School, Dewas (MP)	*Development of a standardized achievement test in maths for class VIII*
12.	SMT. TIWARI, KARUNA Govt. Girls Hr. Sec. School Katangi (Balaghat) MP	*A study on the effects of periodical tests on achievement of students of class IX in general science*

III. COMPARATIVE METHODOLOGIES AND PUPILS' ATTAINMENT

S. No.	*Name and Address of the Investigator*	*Title of the Project*
1	Agarwal, R.K Lecturer Govt. M.P Hr. Sec School Durg (MP)	*A comparative study of the efficiency of teaching spellings by dictation method and transcription method*
2.	Patel, I.U. P.G.T. Kendriya Vidyalaya Surat (Guj.)	*A comparative study of efficiency of assignment method with supervised method in teaching of Hindi*
3.	Km. Nafde Shalini Lecturer Padma Girls Hr. Sec. School Lashkar (Gwalior) MP	*A comparative study of the effectiveness of laboratory method and demonstration method in science teaching*
4.	Sharma, S.R Lecturer Govt. B.T.I. Khairagarh (MP)	*A comparative study into the educational achievement of children studying in practice schools during practice teaching and normal teaching*

IV. INNOVATIONS IN ASSESSMENT, EXAMINATION AND EVALUATION PRACTICES

1.	Km. Ayub, M Lecturer MLB M.P. Hr. Sec. School Seoni (MP)	*Developing of creative expression through introduction of unit tests in Hindi*
2.	Mehta, L.S. Lecturer Govt. Hr. Sec. School Vijai Raghogarh Jabalpur (MP)	*A study of unit testing in economics*
3.	Yadav, P.L. Lecturer and Ber, D.P. Govt. Hr. Sec. School Durg (MP)	*A study of introducing objective type questions and its impact over pupils' attainment in physics*

V. INNOVATED PRACTICES FOR PLANNING AND SYSTEMATICALLY EVALUATED HOME ASSIGNMENTS

1.	Arya, U.S. Lecturer Govt. Hr. Sec. School Dhera (Rewa) MP	*To study the impact of home assignments for class IX students in physics*
2.	Ber, D.P. Teacher and Yadav, P.L. Lecturer Govt. M.P. Hr. Sec. School Durg (MP)	*To study the reasons for not completing home assignments in physics amongst class IX students*

S. No.	*Name and Address of the Investigator*	*Title of the Project*
3.	**DOGRA, J.S.** Govt. Hr. Sec. School Lanji (Balaghat) MP	*To study the impact of planned home assignment achievement of students in physics*
4.	**KM. SHARMA, S.** Lecturer Govt. Girls Hr. Sec. School Barela (Jabalpur) MP	*To study the effect of assigning extra weightage to completed home assignment amongst students of class IX in economics*
5.	**PRINCIPAL** Vidya, R. Group Vidya Mandir Radhu (Tal Matar) Distt : Kaira (Guj.)	*To study effects of assignments in teaching of social studies in class IX*
6.	**SMT. VAZE, MALTI** Govt. Women B.T I Bhopal (MP)	*To study the home work procedure in class V of teaching practising school*

VI INNOVATIVE PRACTICES FOR IMPROVING LIBRARY SERVICE IN SCHOOLS

S. No.	*Name and Address of the Investigator*	*Title of the Project*
1.	**CHATURVEDI, H.S** Govt. Hr. Sec. School Newargaon Balaghat (MP)	*An experimental study for making more effective use of school library*
2.	**GUPTA, B.L.** Teacher Boys Hr. Sec. School Ghatia (Ujjain) MP	*A plan to improve the reading habits of pupils through planned use of school library*
3.	**MISHRA, S.P.** Govt. Hr. Sec. School Monjhari Balaghat (MP)	*An investigation to motivate the students for self-study through planned use of existing facilities of library by themselves*
4.	**PATRE, K.L.** Govt. Hr. Sec. School Changotola Balaghat (MP)	*Survey of the reasons for less effective use of school library and then to suggest plan for better utilization*

VII. INNOVATED PRACTICES FOR IMPROVING BAD HABITS AMONGST PUPILS

S. No.	*Name and Address of the Investigator*	*Title of the Project*
1.	**GAUTAM, V.V.** Project Incharge Govt. Hr. Sec. School New Kahni Junction, Katni (MP)	*Developing a plan to bring about improvement in habit of leaving school before time*
2.	**KOLTE, G.M.** Principal Sahid M. Jr. College of Sc. Art and Commerce Tirora (Bhandara) MS	*Studying the problem of absentees and its remedial measures*
3.	**PUROHIT, D.K.** Lecturer M.P. Hr. Sec. School No. 1 Ratlam (MP)	*Identify the causes of truancy and suggesting remedial measures*

Sl. No.	Name and Address of the Investigator	Title of the Project
4.	PRADIP, C.K. Lecturer Govt. B.T.I. Bemtara (Durg) MP	*Study of habits of mass copying and suggesting ways to remove it*
5.	SHARMA, N.P Lecturer Govt. B.T.I. Chhindwara (MP)	*Study of causes of indiscipline amongst pupil-teachers of teacher training schools and suggesting remedial measures*
6.	SRIVASTAVA, R.K. Lecturer Govt. B.T.I. Sankar Nagar Raipur (MP)	*Study of causes of absence from school suggesting remedial measure amongst pupils of elementary stage*
7.	VERMA, H.S. Govt. Hr. Sec. School Katangi Balaghat (MP)	*Identification of the causes of late coming of students and ways to improve it*

VIII. INNOVATED PRACTICES FOR GENERAL IMPROVEMENT OF INTEREST, ATTITUDE AND SKILLS OF PUPILS

Sl. No.	Name and Address of the Investigator	Title of the Project
1.	JAIN, P.C. Govt. Girls Hr. Sec. School Amoli (Lalbarra) Balaghat (MP)	*To develop attitude towards labour amongst pupils*
2.	NHAVI, R.S. Asstt. Teacher D.M. School, Sangaon Kolhapur(MS)	*To study ways and means to enhance pupils' participation in co-curricular activities*
3.	PANDEY, R.P. Lecturer Hr. Sec. School Lakhnadaum (MP)	*A study of teaching Hindi through allied activities*
4.	PATHAK, M.M. Sheth A.H. Sarswati Vidyalaya Ahmedabad (Guj.)	*Developing a plan to develop good habits for better behaviour and noble character through Sanskrit club activities*
5.	SHARMA MADHUSUDAN Lecturer Govt. B.T.I. Alirajpur, Jhabua (MP)	*To study the causes of disinterest towards teaching profession amongst student-teachers*
6.	SMT. SONWANE, V. Govt. MLB M.M.P.G. Hr. Sec. School Balaghat (MP)	*To make school activities more effective through the student council*
7.	THAKUR, M.N. Govt. Model Hr. Sec. School Balod Durg (MP)	*A plan to develop interest amongst the pupils through out-of-school activities*

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Communal Canker in Education

A Comparative Study of School and Family Environment

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Very little is known about the role of school and family in fostering secular and democratic attitudes in school children. These two being major agencies of socialization, can develop prototype of attitudes for subsequent behaviour. In this context the role of the school in developing a particular orientation in children is very complex. In this study an attempt is made to determine the relative role of these two agencies. The study reveals that the total ideological environment of school system plays an important and crucial role in the attitude formation of children. The school system is a conscious instrument for national integration and secular development in children.

IN THE BROADEST SENSE EDUCATION is synonymous with socialization. Both are concerned with the process of teaching the child how to behave and feel in various situations. Socialization occurs in many settings and in interaction with many people. For purpose of analysis, however, it is useful to distinguish between organized groups, such as family, school and peer groups, and settings, such as media of mass communication, that have significant characteristics in common. These two are called as agencies of socialization. Each agency socializes the child into its own patterns and values. It also helps socialize the child into a larger world. Parents, teachers (schools), peers, and mass media are surrogates of wider social and cultural orders, and their impact extends beyond their own organizational limits.

The first and most important of all the socializing agencies is the family. It is a primary group whose close intense and enduring emotional attachments are crucial for the prototype of subsequent ties, adequate socialization and personality development of the child. The home is the first unit with which the child has a continuous contact and the first context in which socialization patterns develop. It is a world with which he has nothing to compare. The family transmits only segment of wider culture to the child, particular segments depending primarily on its social position in the community. To have a certian religious status means that the child learns particular prayers and rituals. It also means that he is constantly identified with one particular in-group idealization and makes distinction from other out-group idealization and makes distinction from other out-groups.

Parents shape the children in many ways (Radke *et al.* 1952) and are primarily responsible for the determination of the personalities of their children. They establish patterns of decision-making (Kinloch 1973), set ways of interaction (Neugarten 1946) and their behaviour patterns become a norm for them (Sherif 1956). In short, many general features of their life style are determined in parental environment (Goodman 1952)

School environment is also an important factor for the development of attitudes and behaviour by the actual contextual process which the school as a social system influences. The role of school organizational climate in developing a particular ideology in school children is very complex. School environment can inculcate intergroup hostile attitudes through conscious planned instruction (Parson 1959; Merton 1959) as well as informally through inadvertent casual experiences in the school milieu (Loomis 1960). The school organizational set-up and curriculum helped very much in the development of nationalistic ideology in school children in most of the communist countries (Barendson 1966). Even in the United States public schools were found to be most effective and powerful instruments of political socialization (Hess and Toney 1967).

Although there had been very few systematic studies of the teacher impact on student political values in natural classroom settings, the socio-political environment of the school organization climate, and classroom teacher certainly have an impact potential for reinforcing or undercutting the stated objectives of the formal programme of civic education. Evidence suggested that private school teachers are often hostile or uncommitted to democratic principles (Weiser and Hays 1966). However, as a direct transmitter of socio-potitical values, the classroom teacher may be in a relatively strong position. Many teachers prefer controversial national socio-political issues in the classroom while opting for planned desired but presumbly more stimulating topics. Increasing body of researches have shown that teacher's attitude, expectations, and motivation had an important role on pupils' values and performance (Rosenthal and Jacobson 1968, Mehta 1976). The teacher occupies the central place in the classroom teaching learning process. This interaction with pupils set the patterns of classroom behaviour and produce learning climate which can be stimulating or inhibiting for pupils' performance and, therefore, influencing his behaviour.

The relative importance and the schools' impact is still an unsettled question. This is particularly so among adolescents. At the secondary level very little has been done to examine systematically the selected aspects of school environment. To gain some insight into the role of home and school's informal environment an attempt is made to study the impact of family environment and school organizational climate on the development of secular or parochial attitudes in school boys

Methodology

Sample

Before drawing the sample, a list of middle and secondary schools managed by various bodies was obtained from the education department. Keeping in view the results of our earlier study, we wanted to include children from various managed schools, communities and grades. It was further decided to equally divide the sample on these variables. The obtained list of the schools showed greater diversity in their organizational set-up. Formally, they have emphasized and have been following the rules and regulations as laid down by the government for getting the grant-in-aid, but informally they appeared to serve different purposes for their respective managements in religio-political activities. This helped us to establish an image of each school. The selected schools were grouped together on the following criteria: school organizational structure, socio-political ideologies of their founders, perception of public toward these schools, co-curricular activities, objectives mentioned in their syllabus, and composition of a particular community in it. Education authorities were also consulted for this purpose. The government schools formed a separate category since the State Government is running them. Data were collected during July to December in 1973. Thus, in all 23 schools were selected and were grouped into four types of management, viz. Hindu (N=6), Muslim (N=4), secular (N=7), and government (N=6). In selecting these schools purposive random-sampling technique was used. Although strict randomization could not be done because of some practical limitations. A total of 1,120 schools of boys were studied from these schools.

Instruments

The following scales were used :

1. Authoritarian Behaviour Scale (AB Scale)
2. Secular Attitude Scale (SA Scale)
3. Overall Modernity Scale (OM Scale)
4. Inter-Group Attitude Scale (IGA Scale)

These scales were developed in a series of studies to identify (i) some dimensions of secular behaviour, and (ii) factors in socialization and educational process that promote 'communalism' and retard secular behaviour. The scale items went through a series of try-outs at various places (Ahmedabad, Ranchi, Bhiwandi and Udaipur) and repeated item analysis, reliability and validity. The data suggested good item discrimination, satisfactory item validity, adequate test and sub-scales reliability as well as theoretical validity. Except the OM scale, which was largely adapted from Smith and Inkles 1966, the other scales were developed anew. The details about these scales are reported somewhere else (Rao and Mehta 1978).

Data Analysis

Generally, education, occupational position and income have been used to derive an index of an individual's socio-economic status (SES). The educational level and occupation generally showed high positive inter-correlation. The main purpose of child's social class in the present study was to use it as an index of child's home environment. The more educated fathers are expected to provide a different home environment than that provided by the low educated fathers. This could be due to different parental values. Interaction variances were computed on each scale by father's education and school management.

It was hypothesized that children from educated parents and secularly managed schools will tend to promote democratic liberalism (opposite of authoritarian conservatism), secularism, psychological modernity as well as inter-group understanding (opposite of inter-group hostility) as compared to children of low educated parents and parochially managed schools. Father's education and school management will interact and each will contribute something to the differences between various groups. The obtained results are given in Tables 1 to 5. A series of 't' tests of significance were computed between cells as well as between rows and columns.

Results and Discussion

Studies have shown that authoritarianism had a negative relationship to years of education (Cox 1948, Bhusan 1967). Studies have also reported that the *environment of educational institution* was a significant factor in changing conservative attitudes to liberal attitudes (Nowcomb 1943) and in academic achievement (Warkove and Greely 1966, 1969). Thus, children's home environment taking father's education as an index for it and school environment, may foster authoritarian or democratic attitudes in school children depending upon the nature of environment. Children from less educated families will experience a different home environment than the children of highly educated families. If a child is born in a highly educated family with secular school environment, he will tend to show more liberal democratic and secular attitudes as compared to the child who is born in less educated family with conservative traditional family environment. The hypothesis deduced from these observations is put to test and enlarged upon by data derived in the present study.

As seen in Table 1, children of higher educated families consistently showed lower mean authoritarian scores. The authoritarianism in children increased as the level of father's education decreased. Children from illiterate and primary educated parents on the one hand and the children of secondary and college educated parents on the other hand, did not show significant difference in authoritarian behaviour. All the other

TABLE 1

MEAN AUTHORITARIAN SCORES BY FATHER'S EDUCATION AND SCHOOL MANAGEMENT

Father's Education	*School Management*				*X*	*N*
	HINDU	MUSLIM	GOVERNMENT	SECULAR		
Illiterate	50.52	51.58	41.35	37.11	43.39	177
Primary	48.13	49.10	39.56	43.49	45.07	253
Middle	48.06	41.94	32.33	34.88	39.30	259
Secondary	47.51	40.03	25.33	23.07	33.98	289
College	42.53	36.65	24.64	25.70	32.38	142
$\bar{X}$	47.35	43.86	32.64	33.05		
N	302	261	288	269		1120

Father's Education : $F=6.23$; $P<.01$

School Management : $F=8.61$; $P<.01$

Father's Education × School Management : $F=4.49$; $P<.01$

comparisons among the five groups were highly significant ($P \angle .01$). In fact, father's education showed linear negative relationship with children's authoritarian behaviour. Differences by school management (columnwise), however, revealed greater similarity in F-scores. Children in Hindu-managed schools with family education of illiterate, primary, middle and secondary revealed no significant difference in authoritarianism. However, children of highly educated families were found to be less affected by parochial school environment. But in case of Muslim-managed schools, the differences seemed to be more as compared to Hindu-managed schools. The government and secular schools did show differences on authoritarianism, but the school environment seemed to be neutral and hence ineffective to inculcate authoritarianism in children. It is the family environment which seems to be more reinforcing factor for authoritarianism in both the schools. The children of lesser educated (illiterate and primary) families showed significantly more authoritarianism that children of more educated families. Interestingly, the overall mean F-scores for government ($M=32.64$) and secular schools ($M=33.05$) revealed no difference. But children of Hindu ($M=47.35$) managed schools showed significantly more authoritarian attitudes than children of Muslim schools ($M=43.36$). The interaction between father's education and school environment was found to be significant ($F=4.49$; $P<.01$). School management and father's education taking as an index of children's home environment appeared as important factors in authoritarianism. School management appeared as significant factor in children's authoritarianism ($F=8.61$; $P<.01$) than father's education ($F=6.23$; $P<.01$).

Table 2 shows mean secular attitude scores by father's education and school management. School management ($F=6.85$; $P<.01$) and father's education ($F=3.93$; $P<.01$) are found to be two important factors in secularization of school children. The children of illiterate and middle educated fathers were found to have similar attitudes. Like the authoritarian scale, children of HFE (high father's education) and LFE (low father's education) were found to have secular or communal attitudes depending on nature of schools. Thus, if both LFE and HFE children go to secular schools, they tend to show more secular outlook, whereas in parochial schools they tend to show more communalism. It is obviously clear that these differences seemed to be due to school environment. The secular attitude scale consists of items related to tolerance, mutual trust, equality, fraternity, inter-caste understanding, religion, minority, etc. Most of the comparisons were found to be significant by row (father's education) and column (school management) wise. It is, however, interesting to note that children from both the Hindu and

TABLE 2

MEAN SECULAR ATTITUDE BY FATHER'S EDUCATION AND SCHOOL MANAGEMENT

Father's Education	*School Management*				$\bar{X}$	*N*
	HINDU	MUSLIM	GOVERNMENT	SECULAR		
Illiterate	21.76	20.62	25.66	21.02	22.24	177
Primary	19.60	21.03	21.14	20.75	20.63	253
Middle	19.07	22.86	25.40	29.23	24.14	259
Secondary	23.13	22.53	31.34	25.96	25.74	289
College	24.19	25.91	35.36	34.56	30.13	142
$\bar{X}$	21.55	22.59	27.76	26.30		
N	302	261	288	269		1120

Father's Education : $F=3.93$; $P<.01$
School Management : $F=6.85$; $P<.01$
Father's Education × School Management : $F=6.23$; $P<.01$

Muslim managed schools revealed greater similarity in their secular outlook. But the children of both these schools were found to be significantly ($P<.01$) low on secular attitudes than the children of other two schools.

An analysis of Table 3 reveals that father's education accounts more variance in psychological modernity of children than the school management. Interaction between father's education and school management is also found to be significant. Father's education (row-wise) showed

TABLE 3

MEAN OVERALL MODERNITY SCORES BY FATHER'S EDUCATION AND SCHOOL MANAGEMENT

Father's Education	*School Management*				$\bar{X}$	*N*
	HINDU	MUSLIM	GOVERNMENT	SECULAR		
Illiterate	22.62	22.42	23.49	24.03	23.14	177
Primary	21.85	21.89	23.82	18.56	21.53	253
Middle	22.12	22.14	24.16	17.26	21.42	259
Secondary	22.16	23.37	26.82	30.65	25.75	289
College	25.75	24.79	27.01	35.17	28.18	142
$\bar{X}$	22.90	22.93	25.06	25.13		
N	302	261	288	269		1120

Father's Education : $F=5.30$; $P<.01$
School Management : $F=2.89$; $P<.05$
School Management × Father's Education : $F=2.67$; $P<.05$

that the children of both Hindu and Muslim schools did not show significant differences in their modernity mean scores but were found to be significantly lower on all levels of education compared to their counterparts in government and secular schools. School management also revealed that children of four management differed in their attitudes towards socio-psychological modernity.

The children of less educated families (particularly from primary and middle education) showed significantly less modernity in secular schools. When their father's occupation was checked, they belonged to petty shopkeepers, self-employed or to small businessmen. Traditionally they are lower-middle class people. Their home environment still seems to influence children's values and attitudes although they are attending secular schools.

As seen in Table 4, as one moves from parochial to secular schools, there is a continuous decrease in out-group hostility (row-wise). The children of Hindu managed schools showed more unfavourable attitudes towards the out-groups followed by Muslim schools. All the mean differences among these four schools were highly significant, except the secondary educated parents in government (M=26.32) and secular (M=26.62) schools who showed similar attitudes. The overall mean scores by school management showed that the Hindu managed schools children (M=42.12) were found to have significantly more unfavourable attitudes towards the out-groups than the children of Muslim

TABLE 4

MEAN OUT-GROUP ATTITUDE SCORES BY FATHER'S EDUCATION AND SCHOOL MANAGEMENT

Father's Education	*School Management*				$\bar{X}$	*N*
	HINDU	MUSLIM	GOVERNMENT	SECULAR		
Illiterate	43.46	33.37	29.83	27.40	33.51	177
Primary	43.27	34.44	31.16	26.12	33.74	253
Middle	42.29	34.09	30.66	27.03	33.52	259
Secondary	42.16	33.26	26.32	26.62	32.09	289
College	39.44	30.31	27.28	24.43	33.36	142
$\bar{X}$	42.12	33.09	29.05	26.32		
N	302	261	288	269		1120

School Management : $F=4.09$; $P<.01$
Father's Education : $F=11.29$; $P<.01$
Father's Education × School Management : $F=6.38$; $P<.01$

(M=33.69), government (M=29.05) and secular (M=26.32) schools. The overall mean scores of father's education indicate that children of college educated parents were significantly less out-group hostile than the children of illiterate, primary, middle and secondary educated parents.

The influence of father's education and the home environment on children seemed to wither away under the school influence. The results suggested that the home and the school are important and significant factors in children's authoritarianism, secular outlook, modernity and out-group prejudices Of these two, the school appearedto be more potent factor. The privately managed schools appeared to enhance authoritarianism, reduce secularism and modernity, and promote social prejudice in children. The secularizing and democratizing influence of educated homes seemed to dwindle away in interaction with the parochializing influence of the privately managed parochial schools. On the other hand, the parochializing influence of the home (of low educated father) seemed to give away the secularizing influence of the government managed schools. The privately Hindu and Muslim managed schools appeared to wipe off the secular home influence and parochialize the children. The secularly managed schools make good the parochial home influence and secularize the children.

Types of Environment

The results clearly indicated the influence of home as well as school environment on children's authoritarianism, secularism, modernity and social prejudice. The home and school together formed the major portion of child's life conditions. The child breaths, plays and works under these conditions. The results indicated the possibility of two types of home environment—parochial and secular—depending upon the father's educational level. Similarly, the school environment appeared to be either parochial or secular depending upon the nature of school management. These categories are, however, discrete rather than continuous. The categories, two each of home and school conditions produced four possible conditions of child's life, as follows : (i) Parochial-Parochial Environment (PPE) : Here both the conditions at school and home are parochial. (ii) Parochial-Secular Environment (PSE) : In which the school conditions are parochial and home conditions are secular. (iii) Secular-Parochial Environment (SPE) : Where the school conditions are secular but the home conditions are parochial. (iv) Secular-Secular Environment (SSE) : In which both the home as well as the school conditions are secular.

Although the environmental categoreis are discrete, the four types of child's environment tends to fall on a continuum from PPE to SSE. To form these categories we took the children from only low (illiterate and primary) and high (college) educated families assuming that the former had a less secular home environment than the latter. The obtained mean scores for these four environmental categories on various scales are given in Table 5.

TABLE 5

MEAN SCORES ON VARIOUS SCALES BY SCHOOL AND HOME ENVIRONMENT

School × Home Environment	*Mean Scores on Scales*			
	F-SCALE	OS SCALE	OM SCALE	OGA SCALE
Parochial-Parochial Environment (PPE)	49.83	20.75	22.17	38.64
Parochial-Secular Environment (PSE)	39.51	25.05	24.02	34.87
Secular-Parochial Environment (SPE)	40.63	23.89	22.47	28.63
Secular-Secular Environment (SSE)	25.17	35.21	31.29	25.85

Parochialization-Secularization of Children

It was expected that such children who were being socialized under the conditions of PPE would show more authoritarianism, communalism, out-group hostility and traditionality while the children under SSE conditions would show the least of such attitudes.

The obtained results in Table 5 confirm this expectation. The PPE condition of life fostered parochialism in children. As environment became secular-authoritarianism, communalism out-group hostility and traditionality went down. It is, thus, clear that the child learnt authoritarianism, communalism, traditionality (opposite of modernity) and social prejudice from his environment at the home and the school. The private schools (aided by the State) appeared to play a major role in this respect.

The mean scores of OM scale confined the obtained intercorrelations between two sub-scales of psychological modernity with out-group hostility. The general awareness scale showed significant positive correlation (+.201; P<.01) wheres the openness scale showed insignificant correlation (—.103; NS) with out-group hostility. This indicated that a socially prejudiced person may not necessarily be traditional or 'less modern' in values. A psychologically modern person can also be high on social prejudice. This phenomenon seemed to be somehow confirmed by the results of environments. Except in strong secular environment (i.e. SSE), the other environments tended to equally foster psychological modernity in children. It appeared that the responses to modernity items were more cognitive and those of other instruments, particularly the out-group attitudinal responses, were more affective. The informal school environment, therefore, seemed to make differences in effective learning of authoritarianism, communalism and social prejudice.

Secularizing School Children

Studies point out that political socialization does not take place so much though it could also be an important factor. The school may follow the same curriculum, books, systems of examination and certification, and yet some of them secularize children and some others communalize. The difference seems to generate from the 'total environment' and the 'ideological climate' of the school. The nature of school management seems to play a crucial role in this respect. From time to time some attempts have been made by NCERT to curb such parochial tendencies but mostly at the textbooks level. The problem is much broader and so vital that a total programme designed to pay attention to school management, co-curricular activities, recruitment and training of teachers and a host of other things, besides textbooks is needed. As Brofenbrenner (1962) and Dunn and Dunn (1962) pointed out that countries interested in rapid development and political change have to depend heavily upon conscious manipulation of formal as well informal environment of the school. This becomes all the more important as more and more children from lower class homes are entering into schools. For them it could be first generation in education. Their home environment, therefore, may not be conducive in developing liberal democratic and secular values and attitudes in them. For such children, and their number is bound to increase, the school assumes a double role in inculcating democratic-secular-political-orientation. On the other hand, if such children enter a 'parochially' managed school, they are likely to be socialized at variance of the national goals. Thus, the school holds the key for both the ways. It can become a conscious instrument of national integration and democratic-secular development. Or it may become a tool for inculcating political authoritarianism and communalism in children.

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Ph.D. Theses Abstracts

A Study of Fear of Failure, Hope of Success, Achievement Motivation, Anxiety and Concern in Girls

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INDIA IS IN THE MIDST OF a technological and educational revolution. In this revolution, education plays an important role in personal achievement and hence becomes instrumental for national survival and progress. If equality of opportunity is a social goal, education has to yield a social return.

Change in social life is continuous although it may be gradual and unnoticed. Social change may be planned but more often it takes place without intent to plan. This fact of continuous social change and awareness of it should be clearly perceived by the students who are being socially nurtured in the socio-cultural milieu of continuous change. Also with the process of change and progress, the women of India should be made to understand that they form an integral and necessary part of social change. Their talents should not be related to themselves as 'person' but to the 'nation'. If they use their talents in the most constructive and creative way at the local and community level, the social change would be of the desired kind and their capacities may be added to become a part of the nation's progress.

Review at a Glance

Research on Need Achievement and Static Variables

The researches on need achievement and its static variables can be viewed as follows :

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*Thesis submitted to Sardar Patel University (1977)

**The publication of Ph.D. theses abstracts is financed by the Indian Council for Social Science Research, New Delhi

Most of the Indian studies have found that nAch is not related to the age while studies abroad have found that nAch increases with the age up to certain stage from early childhood to young age. However, in a few studies no significant relationship was found between age and nAch.

The studies on nAch and SES relate that there is a difference in nAch and socio-economic level of the group under study. Some Indian studies have found relationship between nAch and SES while others have found no significant difference because of socio-economic status. Studies abroad mention that occupational role and income level affect the nAch level and the middle class have considerably higher nAch scores than individuals in the lower social status.

Indian studies suggest that boys were higher in nAch than girls. In some studies no significance was found between mean nAch scores of girls and boys, though differences in achievement imageries have been found in Indian studies. Boys have more goal anticipation ideas than girls.

Studies abroad mention that in some studies girls were higher in nAch than boys. While other studies have found that the first-born males were superior to the first-born females in nAch. In some of the studies boys and girls were found to be equally achievement-oriented.

Need Achievement Developmental Studies

The basic nature of nAch and its developmental studies stress on the following major directions :

1. Testing and tool making.
2. The roots of achievement motivation and trying experiments on it.
3. Raising achievement motivation in people.
4. Finding out the relationship or achievement motivation with other factors such as child-rearing practices, family influences, socio-economic background, etc.

At present, studies on achievement motivation have spread all over India at school and college levels. A curriculum is being tried out in secondary schools by CASE, Baroda. The leadership training camps for nAch development in youths are also being organized by Xavier's group at all India level. The measuing of achievement motive at different levels of education are being undertaken by research students.

Need Achievement and Other Correlates

The results in Indian studies reveal that there is a positive relationship between nAch and academic performance except in few studies. In the present study, nAch has little influence on the performance of the girl students. Studies abroad also emphasize relationship between them. It is also noted that students with high nAch showed a highly reliable relationship with general academic average.

A few studies have been undertaken in relation to nAch and anxiety It is a developing field of study. Indian studies found that the correlation between nAch and anxiety scores have negative insignificant relationship. Studies abroad also found that anxiety and nAch scores are negatively related. One study reveals that nAch scores obtained under achievement-oriented condition correlated as with test anxiety scores.

In 'achievement motivation' 'fear of failure' and 'hope of success' motives are pioneering studies to be undertaken. Very few Indian studies suggest that individuals have been found with less fear of failure motive in achievement situations. One study reveals that students with fear of failure feeling have been less successful in examination scores in rural as well as urban areas.

The studies conducted abroad have tried to see the effect of success and failure experience in achievement situations. Some studies have found that the effect of success and failure is not directly related to achievement situations while some suggest that the individuals with strong need to achieve may also have an intense fear of failure. This is a new field of study for those who are interested in achievement motivation field.

The self-concept and aspirations affect the achievement level of an individual. The concern is the outward manifestation of it. Individuals with clear self-concept of himself and having high aspirations may have a high concern for their goal achievement. Cantril has tried to study the motive of human concerns, personal as well as national. It differs from environment to environment and with the country too. Two of the Indian studies reveal that individuals with high nAch have high concern for their personal self as well as national. This is an interesting field of study.

Achievement Motivation and its Correlates

These research studies relate to motive characteristics of an individual. The research has measured inner motives of an individual and its effect towards personal and social achievements. Numerous cultural and cross-cultural studies have been undertaken, e. g. nAch and intelligence, the effect of nAch on school pupils, age and nAch, sex differences and nAch, socio-economic status and nAch and the effect of nAch on academic performance. A very few studies have focussed on fear of failure, hope of success, anxiety and concern However, no attempt has been made to study inter-relationship of all these variables and its effect on need achievement. Thus, the investigator could see that there is a felt need to study multivariate variables and its effect, particularly on inner motives of female population

Statement of the Problem

The problem of the study is :

A study of fear of failure, hope of success, achievement motivation, anxiety and concern in the girl students of Sardar Patel University in relation to their socio-economic status and performance.

Objectives of the Study

The following were the objectives of the study :

1 To find out the level of the components of need achievement, fear of failure, anxiety, concern and socio-economic status of the girl students of Sardar Patel University.
2. To study the level of need achievement, fear of failure, and anxiety according to performance, age and streams of the subjects.
3. To study the correlations of need achievement, fear of failure, hope of success, anxiety, concern, performance and socio-economic status.
4. To study the effect of various factors such as fear of failure, hope of success, anxiety, concern, socio-economic status and performance on need achievement.

Hypotheses

The following hypotheses were proposed for the present study :

1. The need achievement score of the girl students of Sardar Patel University is high.
2. Achievement motivation includes 'fear of failure' and 'hope of success' motivation.
3. Achievement motivation is negatively related to 'fear of failure'.
4. Achievement motivation is positively related to hope of success.
5. Achievement motivation is negatively related with anxiety.
6. Anxiety has no relationship with performance.
7. The need achievement has no significant relation with socio-economic status.

8. The need achievement is positively related to socio-economic status.
9. There is no significant relationship between need achievement and performance.
10. There is positive relationship between need achievement and performance.

Selection of the Sample

The study was mainly concerned with the girl students studying at the Sardar Patel University. Therefore, the sample for study was selected from almost all the colleges affiliated to the university. The total population of the girl students studying during the year 1974-75 was 2,972.

The SES scale was randomly administered to find out the SES level of the girl students studying at this university. Secondly, to prepare the time-schedule for the administration of the final tests. The SES scale needed only five minutes to fill up, so it was administered to the girl students during the recess hour. Both rural (Pareek and Trivedi 1963) as well as urban (Kuppuswamy 1962) tools were administered because the investigator found a good number of students residing in the hostels. They come from cities like Bhavnagar, Baroda, Nadiad, Ahmedabad, Rajkot and Jamnagar, etc. in Gujarat State, each having a population of more than one lakh according to the Gujarat Census Report, 1971.

Major Findings

The following are the major findings of the study.

A. Achievement Motivation

1. The need achievement level of girls is very high (mean score 9.78).

2. There is not much significance of difference between the mean score of nAch and performance of the first class, second class, third class and failure students.

3. There is a wide variation between the mean score of nAch and age. This shows that nAch has no relation with age.

4. The mean score of the nAch level of different streams—engineering, home science, postgraduate, education, commerce, arts and science—is equally high.

5. There is a significant positive correlation ($r=0.2372$) between the mean scores for nAch and students' academic performance at .01 level.

6. There is a significant negative correlation ($r = -0.0776$) between the mean scores for nAch and fear of failure at .05 level.

7. Anxiety has no relation with need achievement. The group has normal and situational anxiety in a task performance.

8. The group comprises of the middle socio-economic level and major impetus behind the high need achievement score is their parents' economic level

B. Fear of Failure and Hope of Success

1. The girls have greater hope of success (3.48 mean score) feelings than fear of failure (0.59 mean score) feelings in achievement situations.

2. The significance of difference between the mean score of fear of failure and performance in the first class students is high. This shows that in achieving situations the first class students experiences fear of feelings.

3. The significance of difference between the mean score of fear of failure and streams in the engineering and science students is high.

4. There is a significant positive correlation ($r = 0.3189$) between the mean scores for fear of failure and hope of success at .01 level. This proves the theory that HoS+FoF=nAch.

5. The fear of failure imageries in girls have major categories like reprimand, judicial retaliation, deprivation of love and hostile vague environmental forces.

C. Anxiety

1. The mean score of anxiety in the girls students is 2.65, which is less. They have normal anxiety in a task performance.

2. The level of anxiety and age has no relation with each other.

3. There is a significant positive correlation ($r = 0.0905$) between the mean scores for anxiety and hope of success at .05 level. This means that the hope of success feeling includes anxiety motive in order to reach particular goal.

D. Concern

1. Girls have much more personal fears (mean score 14.34) than their personal hopes (mean score 11.08).

2. The girls aspire more for their own personal character, family, job or work situation, personal economic and social situations, international situations, and the world.

3. The girls show more personal fears by references to their own self, own personal character, personal economic and social situations, people, community and the nation.

4. The girls' perception of their present and future self is less.

5. Girls have much more hopes for the country (mean score 17.89) than their personal hopes (mean score 11.08).

6. They have much more fears for the country (mean score 22.42) than their personal fears (mean score 14.34).

7. Their country s fears (mean score 22.42) are greater than country's hopes (mean score 17.89). This indicates that they are much concerned for the social and national situations but it is internal. They have equally developed their inner and outer self.

8. The girls have more concern for the country's economic, social and political situations, nation's independent status and international situations, relations and peace of the country.

9. The girls show fears and worries about national, political, economic and social situations, nation's independent status and importance, nation's international relations, cold war and peace.

10. Girls' perception of the country's present and future is also very low.

E. Performance

1. The mean score of the performance of girl students is 2.31 which is lesser than the nAch level of girls.

2. The significance of difference between the mean score of nAch and performance of the first class, second class, third class and failures is equally high. This indicates that nAch has less effect on performance.

3. There is a significant negative correlation ($r = -0.1445$) between the mean scores for performance and anxiety at .01 level.

4. There is a significant negative correlation ($r = -0.0981$) between the mean scores for performance and hope of success at .05 level.

5. There is a significant positive correlation ($r = 0.1199$) between the mean scores for performance and fear of failure at .01 level.

F. Socio-Economic Status (SES)

The mean score of SES is 2.65. The SES includes three variables: education, occupation and income. The mean score of the parents' occupational level of the girls is 4.46, educational level 4.52 and economic level 11.34. The parent's economic level is the main backing force for the girls' high need achievement level.

Ultimately, need achievement is an independent motive; other variables have no effect on it.

Major Conclusions

The following are the major conclusions of the study:

1. The literacy percentage of women in rural areas is less than 18 to 20 per cent. The significance of their education should be much emphasized.
2. The camps for the development of creative leadership for women and increase of their need achievement, aiming at fostering initiative and independent thinking may be organized by the education departments at school and college levels.
3. Guidance and counselling programmes may be provided eventually through youth centres for the awakening of their social and national goals.
4. Parents may be awakened to provide feedback to those girls who are highly motivated and opportunities may be provided for proper use of their talents at local groups or through other institutions. A system of honour may be started at local and educational institutions to recognize their potentialities which they possess through certificates, prizes or credit roles. These incentives would encourage them to work more for the society and the nation.
5. Leadership training programmes may be started for girls at the university level.
6. Girls should be involved more and more in decision making processes at the college level. Their activities should be utilized to their maximum mental and physical potentialities. Ultimately, this would help them to reach social and national goals.
7. The role of women outside home has become an important feature of the social and economic life of the country and in the years to come. Therefore, it is necessary to pay adequate attention to the problems of training and employment of women. An important problem is to enable these women to carry out their dual role of home making and following a suitable career to enable these women to participate in programmes of national reconstruction.

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A Differential Study of the Personality Characteristics of Scheduled Castes, Backward Classes and Non-Scheduled Caste University Students

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THE INDIAN CONSTITUTION provides concessions and special provisions for scheduled castes, scheduled tribes and other backward classes in the field of education and employment. The disabilities of these scheduled and backward class students are not only economical, cultural and structural but also may be due to certain psychological complexes and inadequacies. The facilities provided to them in the past 30 years or so should have been instrumental in reducing the severity of these disabilities. The gap that existed between the psychological development of the scheduled and backward class students on the one hand and that of the non-scheduled caste students on the other hand should have also been bridged as a result of these facilities, protections and securities. Consequent upon the decrease of psychological disabilities and inadequacies, differnce in their academic achievement should not also have been significant, as academic achievement is largely a function of socio-economic facilities and the psychological adequacy of a person. If no difference is found on these counts between scheduled and non-scheduled caste students it could be concluded that the governmental and other facilities provided to these scheduled and backward class students have been beneficial to them. In case, it is found, otherwise, it may be considered that the facilities thus far provided to the scheduled and backward class students have not had sufficient impact on the development of these students.

Purpose of the Study

The task under this problem is essentially to compare in psychological perspective the scheduled and backward class students with the non-scheduled caste students. The sample for the study was drawn from graduate and postgraduate students. It is presumed that these scheduled and backward class students have been exposed to the facilities provided to them by the Government of India and also by various other social agencies over a sufficiently long time in the past. The real challenge with respect to scheduled caste students comes in the attempt to understand their personality characteristics, to know them as students beyond the normative sense, to evaluate them how not only they are like others but also in what ways they are different from non-scheduled caste students? Have the differences between scheduled and non-scheduled caste students on their cognitive, emotional, and personality characteristics reduced, specially, need, self-concept, intelligence and academic achievement? Again, do scheduled caste and backward class students, specially of Meerut University, constituting the basis of this study, show any visible signs of moving closer to the non-scheduled *caste students with respect to their personal and academic development*? The very idea that one is regarded as low by reason of the accident of birth is psychologically disturbing. These are some of the questions that are raised in the present study while reconsidering the issue of equalization of opportunities in the context of scheduled and backward class students.

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*Thesis submitted to Meerut University (1978)

Assumption of the Study

The basic assumption underlying this study is that the personality development and academic achievement are a function of environment and hence the scheduled caste and backward class students having been subjected to socio-economic and clutural deprivations for long must be different in many respects from the general group of students.

The investigator being a teacher-educator of long standing and hostel warden, predominantly of scheduled and backward class students has, on the basis of his observations and experience, strongly felt that the general behaviour, academic performance and personality characteristics of these scheduled and backward class students are much different from those of the non-scheduled caste students.

Population and Sample

Population for the present study has been defined as the total number of scheduled caste and backward class students of graduate and postgraduate classes of 65 affiliated colleges of Meerut University. However, 11 girls colleges and one medical college were not included in the population for the sake of convenience. The present problem is confined only to male graduate and postgraduate students. Out of the remaining 55 affiliated colleges of Meerut University, only six colleges were selected at random, which constituted 10 per cent of the total population.

Tools Used

The data for the study were collected with the help of the following research tools measuring variables involved in the study :

(i) Personality (13 needs)	(i) Meenakshi Personality Inventory.
(ii) Self-Concept (5 aspects)	(ii) Bhatnagar's Self-Concept Inventory.
(iii) Intelligence (General)	(iii) Raven's Standard Progressive Test.
(iv) Academic Achievement	(iv) Academic Cumulative Records.

Results and Discussions

So far as scheduled caste and backward class postgraduate students are concerned, they may be characterized as more enduring, more nurturant and more achievement oriented, but still suffering from feelings of abasement as the n-achievement, n-abasement, n-endurance, n-nurturance are more dominant in them as compared to other needs. Next, in order of magnitude, come n-autonomy, n-affiliation, n-succourance. They are much less exhibitionistic and dominant.

The graduate students of scheduled and backward class also present almost a similar picture. N-Achievement, n-nurturance, n-endurance, n-exhibition are found dominant in them also, next in order being n-affiliation, n-autonomy and n-succourance. In comparision to the postgraduate students of scheduled castes and backward class, the graduate students in addition emerge to be affiliative also.

When compared to the non-scheduled caste graduate and post-graduate students, these scheduled and backward class students are found to be significantly different in several respects. The results showed that the difference between mean score of the scheduled and the non-scheduled graduate students on n-autonomy, n-affiliation, n-dominance, n-abasement, n-nurturance, n-endurance and n-aggression, are significant, all at .01 level except n-autonomy and n-affiliation which are significant, only at .05 level. The scheduled caste graduate students have significantly higher means as compared to the non-scheduled caste students on n-affiliation, n-succourance, n-abasement, n-nurturance and n-endurance. This means that the scheduled caste graduate students, as compared to the non-scheduled caste graduate students are more affiliative, more in need of feeling inferior, more nurturant and more eduring. In other words, they harbour in their heart, perhaps a greater desire to seek positive relationships with others, a desire so that others should be sympathetic towards them. Similarly, they desire to be more hard-working and persistent in their efforts as compared to the non-scheduled caste students. With all these positive qualities, this also emerges that the need to feel inferior is stronger in them in comparision to the non-scheduled caste students.

However, sufficiently lower levels of n-autonomy, n-succourance, n-dominance and n-aggression are found in them in comparison to the non-scheduled caste students. Perhaps they are less aggressive, less dominant and less succourant as compared to the non-scheduled caste students of graduate level. These are the qualities of personality which are called for to push ahead in the modern complex and competitive society. On these the scheduled caste graduates stand lower in comparison to the non-scheduled caste students.

In case of the postgraduate scheduled caste and backward class students however, it appears that they have a greater desire to achieve and greater desire to make sustained efforts to achieve in comparison to the non-scheduled caste students. Both the n-achievement and n-endurance are stronger in them as compared to the non-scheduled caste students. But these students also like the scheduled caste graduates have a strong tendency to feel inferior. The needs of autonomy, dominance and aggression are weaker in them as compared to the non-scheduled caste students of postgraduate level. It may be generalized that the scheduled caste students of postgraduate classes are more achievement-oriented, more enduring and more in need of feeling inferior, less aggressive, less dominating and less in need of autonomy as compared to the non-scheduled caste students of the same level.

As regards the structure and organization of the self-concept, the two groups of students are much different from one another. On four out of five aspects of the self-concept, significant differences have been found between the mean score of the scheduled and non-scheduled caste students. The mean scores of the scheduled caste graduates as compared to the non-scheduled caste graduates are significantly higher on achievement, confidence, inferiority and emotional instability. This may mean that the scheduled caste graduates perceive themselves to be better achievers and more confident in comparison to the non-scheduled caste graduates. Also, it is found that they perceive themselves who feel comparatively more inadequate and inferior and who suffer more from feelings of emotional instability. These are contradictory trends characterizing their self-concepts. Co-existence of these contradictory trends is surprising and somewhat unexpected. It cannot be explained on the basis of this research and need further probing.

In case of the postgraduate students, however, slight departure from the above picture of the self-concepts of the scheduled caste graduates is noted. Self-perception on the achievement dimensions show no significant differences between the scheduled and the non-scheduled caste postgraduate students. On other dimensions, significant differences are found in the same directions as pointed out earlier in case of the graduates. Hence, what is said about the self-concepts of graduates is almost true about postgraduates also.

So far as general intelligence is concerned, the scheduled caste students, both graduates as well as postgraduates are found to be inferior in comparison to their non-schedualed caste counterparts. The difference between them is significant at 0.01 level.

The graduate and postgraduate students of scheduled and backward class are found to be poor achievers as compared to the students of non-scheduled castes. The mean achievement index of these students is significantly lower than that of the non-scheduled caste students. In view of lower level of intelligence and poor self-concepts characterizing these students, poor academic achievement is not surprising.

Thus, the study has thrown sufficient light on the personality structure, intelligence and academic achievement of the scheduled caste and the backward class graduate and postgraduate students. It is found that they are different from other caste students in several ways. The study has also brought out the positive/negative, less dominant and more dominant traits of their personality. It has also shown where they stand with respect to intelligence level and academic achievement as compared to other caste students.

Implications for Education and Further Research

These findings have important implications for the education of scheduled and backward class graduates and postgraduate students, particularly with regard to social and educational policies.

One thing that is clearly brought out by the study is that the scheduled and backward caste students of graduate and postgraduate classes are inferior to their non-scheduled caste counterparts, with regard to intelligence and academic achievement. In spite of the protection provided to them by the government, they have not yet come at par with the higher castes. This has to be subjected to further intensive research and if confirmed, has to be taken into consideration while preparing welfare policies for the scheduled and the backward caste students. May be that the various welfare schemes were required to be extended and intensified. However, if further research shows that the level of intelligence and academic achievement of the students of scheduled caste and backward class have not gone up, revision of existing policies may become imperative.

The subject of the study is of vital concern to educators. The study has, at least, reaffirmed the importance of personality characteristics in academic performance.

Some Contributions to the Theory of Sampling for Correlation Coefficient

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IN SOCIO-ECONOMIC SURVEYS now a days, the data on a large number of characters, e.g. income, education, number of children, age, social participation, etc. is collected. For this purpose some suitable sampling plan is used and the correlation coefficient between two variables is calculated to examine which of the two characters are highly correlated. In finding the correlation coefficient the usual estimator

$$r = \Big[\overset{n}{\underset{i=1}{S}} (x_i - \bar{x})(y_i - \bar{y})\Big] \Big/ \Big[\overset{n}{\underset{i=1}{S}} (x_i - \bar{x})^2\Big]^{\frac{1}{2}} \Big[\overset{n}{\underset{i=1}{S}} (y_i - \bar{y})^2\Big]^{\frac{1}{2}} \quad \ldots \text{(1.1)}$$

is used. The important question that arises is to investigate as to whether r should be used for all the sampling schemes or estimators of R should be developed on the basis of the sampling scheme used? In the present work it is tried to find an answer* to this question.

Review of Literature

The correlation coefficient R is a measure of interdependence between two variables (X,Y) in the population and is defined as the ratio of the covariance and the product of the standard deviations of the two variables X and Y. The correlation coefficient R was first introduced by Bravais (1846) and an estimate r (1.1) of this parameter from n pairs of sample observations from a bivariate normal population was advocated by Pearson (1896).

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*Thesis submitted to Meerut University (1977)

In order to study an estimator's expected closeness with the population parameter it becomes necessary to find its distribution, mean, variance and other moments. Soper *et al.* (1917) worked on this and obtained the approximate distribution of r for samples from bivariate normal populations. The exact distribution of r was obtained by Fisher (1915, 1921) for bivariate normal population.

Pearson and Filon (1898) gave the expression for variance V(r) as $(1-R^2)^2/n$ for bivariate normal distribution when n is large. Later, Fisher (1915) obtained the exact distribution for r as mentioned earlier when samples are drawn from a population following the normal correlation surface and variance was given as $(1-R^2)^2/(n-1)$ approximately for large samples. Elderton (1953) also supported $(1-R^2)^2/(n-1)$ as the variance of the estimator r for bivariate normal population even for small values of n if R=O, but the approximation becomes less and less satisfactory as R increases.

Hotelling (1953) while working out variance of r found that for bivariate normal distribution expected value of r

$$E(r) = R\left(1-\frac{1-R^2}{2n}\right)$$

In addition to the variance of r, Romanovsky (1925) also discussed the moments of r in samples from normal populations.

An estimator of R was proposed, for stratified random sampling, by Aoyama (1954). In case of stratified random sampling when the variables are identically distributed and following a continuous bivariate distribution was thoroughly studied by Wakimoto (1971).

Methodology

In view of the extensive current use of sampling in socio-economic fields, where normal or infinite populations are not generally available an estimator of R for finite populations is needed. The estimators for the population correlation coefficient R have been developed appropriate for simple random sampling, stratified random sampling, systematic sampling, unequal probability sampling with (PPSWR) and without (PPSWOR) replacement sampling. Apart from the usual estimator the two types of estimators were developed by using the following procedure.

Since R is the function of variances and covariance, for the first type of estimators the unbiased estimates of variance and covariance were developed and substituted into the expression of R. For the second type the individual unbiased estimators for eachco mponent of the variances and covariance were worked out and used to obtain an estimate of variance or covariance. For example, the population covariance s_{xy} between two variables X and Y involves the components $\overset{N}{\underset{i=1}{S}} X_i Y_i$, $\overset{N}{\underset{i=1}{S}} X_i$ and $\overset{N}{\underset{i=1}{S}} Y_i$. The unbiased estimators of these components are obtained and used to get an estimate of the covariance. Similarly, the estimates of variances are obtained. These estimates of variances and covariance are then used in the expression of R to get its estimate.

First type of estimator for R could not be developed for systematic sampling as the unbiased estimation of the variance and covariance terms in this scheme is not possible.

The population correlation coefficient R is the ratio of covariance $C(X,Y)$ and $[V(X).\ V(Y)]^{\frac{1}{2}}$ so that even when the unbiased estimators of $C(X,Y)$, $V(X)$ and $V(Y)$ are used in the expression for R the resulting r or other proposed estimators r_i, $i=1,2,\ldots\ldots\ldots,7$ are not unbiased. The expressions for bias $B(r_i)$, upper limit of bias, the variance $V(r_i)$ and estimate of variance $v(r_i)$ have been obtained. These expressions were also obtained for the usual estimator r of R.

The efficiency of the proposed estimators has been calculated empirically for several sets of data as it was not possible to make a mathematical efficiency comparison because of the extremely lengthy variance expressions being involved.

Results and Discussion

(*a*) *Simple Random Sampling*

In case of simple random sampling, the two estimators of R obtained by using the technique of generating the estimators proposed earlier also turn out to be same as the usual estimator r. Also the estimator r has only been studied for infinite bivariate populations. In the present work r has been studied for finite populations. Both the schemes, simple random sampling with (SRSWR) and without (SRSWOR) replacement have been considered.

The expected value E (r) and variance V (r) obtained for finite populations turn out to be same, as reported by Hotelling (1953), Fisher (1915, 1921)and Elderton (1953), if the joint density function of the random variables (x,y) be bivariate normal. In fact, E (r) and V (r) obtained for finite populations are the general case and the results deduced for bivariate normal population, are the particular case.

These are the findings on the basis of several sets of data :

1. The V (r) for SRSWOR is always less than that of SRSWR.
2. The V (r) for SRSWOR and SRSWR were usually less than the variance $(1-R^2)^2/(n-1)$ which we use in practice as the variance of the usual estimator r.
3. Present relative bias and B/S.D. for bivariate normal population are negative while for SRSWOR and SRSWR from finite populations no trend is observed.
4. For bivariate normal population, variance, percentage R.B. and B/S.D. decreases with the increase in the sample size while the same treatment does not always hold for finite population case.
5. The per cent relative bias can sometimes be appreciable but it usually decreases with the increase in sample size.

(b) *Stratified Random Sampling*

The estimators r_1 and r_2 have been proposed for this sampling scheme. The empirical comparison has been made for the same set of data between r_1, r_2, r and what we use in practice which is infact, meant for bivariate normal population.

For one set of data in case of bivariate normal population B/S.D. for the estimator r is less than 0.09 while for the same estimator (r) for finite populations B/S.D. ranges from 0.8686 to 3.3569. In normal theory if B/S.D. is greater than 1.96 at 5 per cent level of significance the bias can be said to be significantly large. Thus on the basis of the expected value and variance of r which we use in practice, we shall say that r is a good estimator while in the other case, i.e. using r as a estimator of R for finite populations and the sample being taken with stratified random sampling we shall infer that r is not a satisfactory estimator.

Therefore, it is concluded that the expression of the variance V(r) is appropriate and should be used for the case of stratified random sampling.

A particular estimator cannot be said to be the best since an estimator which is best in one sample allocation becomes most inferior in the other allocation even for the same population. This leads to the conclusion that although stratified random sampling scheme results in an increase in efficiency when population total (or mean) is being estimated but it is not effective for the estimation of R.

(c) *Systematic Sampling*

In case of systematic sampling the estimator considered is the usual estimator r (1.1).

The V(r), per cent relative bias and B.S.D. in case of systematic sampling do not exhibit any particular trend with the increase in the sample size. However, for a simple random sample drawn from bivariate normal population all the V(r), per cent relative bias and B/S.D. decrease with the increase in the sample size. When the two situations are compared with each other there is no definite trend

(d) *Probability Proportional to Size with Replacement*

Three estimators r_3, r_4, r_5 and the usual estimator r of R have been considered when the units in the sample are selected with probabilities $(P_i, \sum_{i=1}^{N} P_i = 1)$ and with replacement. A sample of n units is selected from a finite population of N units and the measurements on the characters X and Y are recorded for the selected units.

The variance, per cent relative bias and B/S.D. have been tabulated, for 15 sets of population for the estimators r_3, r_4, r_5 and r. The case of bivariate normal population has also been included.

The following are the important observations that can be made from the study.

1. The expected values and variances of estimators r_3 and r_5 in some populations are numerically more than unity due to the fact that they do not satisfy the condition that r_i lies between $+1$ and -1 ($i = 3, 5$). Because of this the bias involved in these estimators can sometimes be very high, so these estimators are not satisfactory.

2. The value $(1-R^2)^2/(n-1)$ which we use in practice as the variance of the estimator r is more in some cases and less in the remaining cases in comparison to the actual finite population variance V (r) for PPSWR scheme.

3. None of the two estimators r_4 and r is consistently superior to the other. This leads to the conclusion that although PPSWR scheme results in an increase in efficiency when population total (or mean) is being estimated still it is not efficient for the estimation of R.

(*e*) *Probability Proportional to Size without Replacement*

For PPSWOR sampling two alternative estimators r_6 and r_7 have been considered along with the usual estimator r.

The variances, per cent relative bias and B/S.D. for the estimators r_6, r_7 and r along with the bivariate normal population for 10 chosen populations of size $N=12$ and a sample of size $n=6$ have been calculated.

In calculating $V(r_6)$, $V(r_7)$ and $V(r)$ the system of sampling due to Midzuno (1950) is used. The unit at the first draw is selected with unequal probabilities (P_i) of selection, while at all subsequent draws, the units are selected with equal probabilities and without replacement.

For the estimator r_6 the variance in almost each and every population is greater than the variance $V(r_7)$ of the estimator r_7. For the Midzuno's scheme of sampling, therefore, r_7 is possibly more efficient than r_6.

$V(r_6)$,$V(r_7)$ and $V(r)$ are less in all the populations in comparison to $(1-R^2)^2/(n-1)$, the variance of the estimator r for a simple random sample drawn from a bivariate normal population (which we use in practice).

No general inference regarding the relative efficiency can be made as no particular trend is observed in the situations considered.

Conclusions

From the empirical investigation it is observed that the various sampling procedures available in literature though useful in efficient estimation of population mean or total are not at all effective in the estimation of the population correlation coefficient R. The usual estimator r of R which has been suggested for the case of simple random sampling is as good as the estimators appropriate for the various sampling procedures.

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A Study of Some Aspects of Thinking among Science Students of Adolescent Age

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EDUCATION for understanding and problem-solving is gradually becoming the chief goal of instruction at school in the wake of revolution in science and technology, all over the world. With a view to achieve the goal, it is necessary to investigate 'pupil thinking'—a term which appears to suffer from multiplicity of meanings according to Bartlett, Peel and Russell. At the beginning of the century, John Dewey suggested that 'thinking' takes place in stages. This led several workers like Bloom, Duncker, Johnson and Mills and Dean to see varied stages in thinking. Whereas it is more difficult to establish stages than to find stages in the solution of any problem involving complex reasoning, at the same time, it is comparatively easier, according to Duncker, to investigate thinking empirically through problems which have clear-cut solutions. In fact there are several problems in the area of thinking which need intensive investigation. The present study investigates some aspects of thinking among science students of adolescent age.

Objectives

The main objectives of this study were :

1. To study thinking (problem-solving) processes, evoked by individual problems, each containing a continuous chain of reasoning.
2. To study the same processes when appropriately grouped, regardless of the typology of problems.
3. To study errors as they occur in solving these problems.
4. To determine the relationships between scores on thinking and some outside variables ; intelligence, sex, various immediate test reactions to the problems on presentation and adjustment.
5. To find out the characteristics of successful and unsuccessful problem-solvers.
6. To analyse the structure of the appropriately grouped processes of thought factorially and interpret them psychologically.

Hypotheses

The following hypotheses were proposed and tested :

1. Problem-solving takes place in stages.
2. The scores on problem-solving are significantly related with the following independent variables ; intelligence, sex, immediate test reactions to the problems on presentation and adjustment.
3. The complex problem-solving processes arise from simple problem-solving processes.
4. A given problem is solving over a wide IQ range.
5. Poor problem-solvers are influenced more by the content rather than the form of the problem.
6. There are significant differences in respect of the variables included in this study.

Procedure

Sample and subjects : A sample of 200 students, 100 boys and 100 girls, ranging from age 10.5 to 11.5 to 14.5 to 15.5 years from Grades VI to X was selected on the basis of intelligence and socio-economic status. Pupils within each sub-sample (20 boys and 20 girls) and across five sub-samples were matched on intelligence and socio-economic status which were measured by the group mental ability test by Jalota and the socio-economic status scale by Kuppuswamy.

Selection of problems : Seventeen problems containing continuous chain of reasoning were finally included in this study, which were administered individually in two sessions. These seventeen problems were further analysed in terms of thinking processes necessary to solve these problems which were further reclassified into seventeen schemes of thought : Using constant difference, using summation, using proportion, Beaker combination; using two digits at a time, using three digits at a time, using four digits at a time, generalization to algebraic symbols (summation), generalization of algebraic symbols (proportion), stating hypotheses, testing hypotheses, stating procedures, proposing tests, formulating problematic situations (fluency), formulating problematic situations (flexibility), using insight and failure to grasp the essence of the problem.

In addition to the intelligence test and socio-economic status scale, adjustment inventory as developed by M.S.L. Sexena was used which provided five measures of adjustment : home, health, social, emotional and school. Summated scores on immediate reactions to some of the problems on presentation were also obtained which related to understanding felt difficulty, confidence and interest in solving problems.

Summary of Findings

Subsidiary findings being numerous, the main findings of this study indicated :

1. Pupils of the lower grades experience difficulty while reading the problem. They also miss the answer spaces. Each one is affected differently over a wide IQ range by the baffling nature of the problem.

2. Except occasional fluctuations, average performance on each problem increases with grade. Mean performance in most of the cases favours boys rather than girls. Boys and girls (or girls and boys) try hard to equalize their performance as they go up the grades.

3. A given problem, part of the problem or process in that problem *is solved successfully or failed over a wide IQ range both within and* across the various grades.

4. A given problem is solved in stages. It is possible to identify stages in the solution of any problem empirically. In continuation, each pupil sees the problem in his own unique way except when problem is solved mechanically.

5. Largely speaking, pupils show gradual mastery in an increasing manner over the various processes, taken individually, as they move into higher grades. It is in the closing grades only that they appear to verbalize or state their methods of attack. Here again, the very choice of the problem is the single determining factor.

6. Unexpectedly, pupils commit a large number of errors while solving problems. These errors further increase when they ignore or forget or fail to grasp the main demand or requirement of the problem. Each process of thinking underlying a given problem has attracted, largely speaking, a large number of errors, sometimes, as many as 49 These errors when committed in small numbers, that is, by less than 15 per cent, of the pupils (N=200) appear/disappear, reappear and sometimes persist across the various grades. Others, which are dominant, that is, shared by more than 15 per cant of the pupils, have a general tendency to decline with age which is an expected finding.

7. Over three-fifths of the pupils from Grades VI to VIII are badly affected when a problem involves a sort of reversibility in thinking or thinking has to be done in the opposite direction. When it comes to the generalization of arithmetical thinking to algebraic symbols, pupils belonging to Grades VI through IX fail to generalize their thinking to them.

8. When a problem can be solved through two schemes of thought, one inferior and the other superior and if the lat er is not well developed, the resort to the former may favour quite a few in solving that problem.

In case, these two schemes of thought are absent, there is a little chance for a given hint or illustration necessary in the solution of that problem, to be utilized during problem-solving. This possibly explains why the pupils of Grades VI to VIII have failed in making use of hint or illustration in their problem-solving behaviour.

9. According to Gestalt psychology, the problem is seen as a whole. The present investigation does not support this view. It is only in Grade X that the pupils are in a position to see the digital problem as a whole.

10. Depending upon the nature of the problem, adolescent pupils, contrary to Piaget, are affected to a varying extent by the content of the problem. The overall incidence of content influence in terms of multiplicity of responses declines with grade, that is, from 68.46 per cent to 32.92 per cent from Grade VI through X.

11. In their attempts to solve the problem, the adolescent pupils magnify the problem out of its proportion by bringing several extraneous considerations into the problematic situation which distort its logical solution. In this resulting frame of reference, they carry out astonishingly complicated reasonings. Our experience with these problems showed that attempts were not blind at all despite the fact that they continue to rub the problem at the wrong end.

12. Pupils of Grades VI and VII do not possess the scheme of proportion in solving the spring balance problem. Their performance on this problem in the next higher grades is also poor except in Grade X where 75 per cent of the boys and 55 per cent of the girls are in a position to tackle the various aspects of the problem successfully. Further, it is only in Grade IX and X that pupils are in a position to see the weight of the container as detachable from the main demand of the problem. In the lower grades, it is found merged with the demand of the problem itself.

13. Like exhausting combinations or all possibilities majority of the adolescent pupils, when it comes to the proposing of tests for distinguishing among three rods, do not care to exhaust or propose all the possible tests. If any one of them proposes one test, he considers it unnecessary to propose the second test for the problem if the first case stands solved. If compelled or placed in a tight situation, he may end up with another, extra test. Unless coaxed still further, there is again hesitation in proposing the third test, for third stick already stands identified by the process of elimination. There is another interesting observation as well : 7.5 per cent of the pupils most of them from Grades IX and X, have suggested a 'rusting' test. It means that they can await pronouncement of definitive judgement in their thinking for a couple of days if the nature of experimentation so requires. It is a healthy sign or a creditable achieve-

ment on their part that they just considered this test. Lastly, it is 14 5 per cent of the pupils coming from Grades VIII to X who have proposed more than one-third of the total number of proposed tests. It is in these grades only that extent of thought brought into play on this problem has been manifested.

14. In accordance with Piaget's view, adolescent pupils are in a position to set up hypotheses. Among them, only 71 per cent are in a position to set up three or more than three hypotheses. This again further confirms that the adolescent pupils do not imagine all the possibilities in toto. Secondly, whereas adolescent pupils are in a position to set up hypotheses, they also, contrary to Piaget's viewpoint, make comments in form of arbitrary errors which have nothing to do with the solution of the problem.

15. Barring few fluctuating cases, the ability to test hypotheses does not appear among pupils from Grades VI to VIII. It does not appear among girls of Grade IX but in the next higher grade, they beat boys by 10 per cent. The data indicated that more than 70 per cent pupils of Grade X could not manifest the ability to test hypotheses which means that to that extent the individual minds of even Grade X children have not become experimental. Considering the three study variables in isolation, these were isolated by 13.5 per cent (length of the tube); 9 per cent (size of the hole); and 2 per cent (level of water), of the pupils Here it is interesting to note that the third variable is more open to observation than the second one. Lastly, pupils experience difficulty in verbalizing their methods of attack despite the fact that they are aware of the solution of the problem to a certain extent. This difficulty disappears when the problem is found fully mastered. It is only in Grade X that a few of the pupils are in a position to verbalize their methods of attack. Here also, the role of the problem selected is critical.

16 The adolescent pupils ask all sorts of questions, some of them are quite simple and others are not even questions at all. Some examples of the latter are :

i Man rides on the cycle (It is a statement of observation and not a question at all).
ii. The cycles and cows are of many colours (Statement).
iii. Is cow a ball of fire ? (A carry-over of the question used as illustration : Is sun a ball of fire ?)

It is anybody's guess why these questions should agitate their minds. Secondly, it is interesting to note that the accepted questions ran into seventeen distinct categories. Thirdly, fluency and flexibility as defined in this study were strongly correlated (r=6023, significant at 1 per cent level).

17. The complex problem-solving processes arise from simple thinking processes. It is precisely for this reason that items relating to the following schemes of thought come out late in development: generalization to algebraic symbols, testing hypotheses, using insight, and failure to grasp the essence of the problem. Further, it needs well developed schemes of thought of using constant difference, using summation and using proportion before the relationship. Extension is proportional to the stretching force that emerges or is discovered, a process which appears mastered, largely speaking, in Grade X.

18. Except occasional fluctuations, the grade means on the various schemes of thought show an increasing trend with age. The close analysis of the various means indicates that all the schemes of thought do not develop equally across the grades. For example, generalization to algebraic symbols (summation) and testing hypotheses evolve marginally in pupils of Grade VI through X

19. Using principal component analysis on the combined matrices containing 45 variables and the varimax rotated factor structures with a view to obtain the hypothesized factors and interpret them psychologically, the following multiple factors appeared . (i) Schematic learning general, (ii) Adjustment, (iii) Problem orientation, (iv) Sensing problems, (v) Symbolization, (vi) Testing hypotheses, (vii) Using constant difference, and (viii) Aspect character (single).

20. Problem-solving, largely speaking, favours boys rather than girls. Right throughout the grades, both try hard to equalize their performance Considering the pooled sample sex-wise (N=100 boys and girls each) and the conventional levels of significance, it was found that significant differences between the two were found on four problems as well as seven schemes of thought out of 17 problems and 17 schemes of thought. Considering the conventional levels of significance, the top group differed significantly from the bottom group in home adjustment, health adjustment, emotional adjustment, social adjustment school adjustment and understanding of the problem and all the seventeen schemes of thought. Lastly, the teacher evidence when collected informally showed that most of the unsuccessful problem-solvers are highly distractable, show poor concentration and are little interested in school work which was, however, not the case in the case of successful problem-solvers.

Educational Implications

Several educational implications emerge from this study. First, immediate test reactions to the problems on presentation are highly individual reactions which definitely set a tone for solving a given problem. So the very choice of problems is very critical in the development of thinking. Secondly, it is very necessary to use those problems which have clear-cut solutions. The workable proposition appears to be that of analysing known problems in such a way as to develop research skills. Thirdly, this study has shown that the use of pin-pointed questions helps students in thinking specifically. Fourthly, certain schemes of thought like scheme of poroportion, generalization to algebraic symbols and testing of hypotheses come out late in development. This finding highlights the problem of providing psychological support to the various school subjects. Fifthly, a given problem or a process in the thought structure of a problem is passed or failed over a wide IQ range not only within the individual grades but also across the grades as well. As expected, adolescent pupils commit a large number of errors while engaged in problem-solving. Sixthly, pupils need training in asking searching questions.

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The Influence of Rigidity on Proactive and Retroactive Inhibition of Verbal-Associates Learning

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VERBAL LEARNING refers to the laboratory study of the processes involved or related to the acquisition, retention and transfer of association of verbal units. These studies are done under controlled conditions (Jung 1968). Literature on verbal learning is replete with studies which point to the role of interaction of successive learning experiences on forgetting. Earlier learning affects the acquisition of new learning experiences which in turn affect the retention of earlier experiences. Research on factors influencing these retroactive and proactive interference has largely been confined to the nature or properties of the interacting material. But all the individuals do not experience an equal degree of

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Thesis submitted to Sri Venkateswara University (1975) retroctive and proactive inhibitions. The reason may be any, e. g. intelligence, anxiety or verbal ability. The investigator has attempted to relate the rigidity, flexibility characteristics of individuals to the retroactive and proactive inhibition experienced by them in a given learning situation. By behavioural rigidity the investigator means a tendency to perseverate and resist conceptual change, to resist the acquisition of new patterns of behaviour, and to refuse to relinquish old and established patterns (Schaie 1955) The researcher has compared the retroactive and proactive inhibition of rigid individuals with that of flexible ones. The verbal meterial was nonsense-nonsense, word-nonsense and word-word pairs. The retroactive and proactive inhibitions were estimated in an A—B, C—D paradigm using the subject as his own standard with necessary precautions.

Studies on memory can be classified under two categories (1) long-term memory and (2) short-term memory. In short-term memory the items are presented only once for a short period of time and recalled after a brief interval but in long-term memory the items are presented or rehearsed several times and recalled after a long period of time.

Most studies of verbal learning have employed one of two standard tasks, viz the serial paradigm and the paired-associates paradigm (Postman and Goggin 1964, 1966). Serial learning consists of learning a set of verbal units in a sequence and paired-associates learning involves the formation of association between the members of a pair of items. The total number of pairs in a paired-associates list is generally between 8 and 15. Experiments on the second type of learning, i.e. paired-associates, may involve any of the two : short-term memory or long-term memory Some of the important variables influencing retention in long-term memory of paired-associates that have been studied are· response competition, unlearning, list differentiation, extra experimental interference and spontaneous recovery. One of the various models to explain processes involved in paired-associates learning is classical conditioning. The investigator has discussed relationship between intelligence, different personality factors and paired-associates learning and also mediation, transfer, retroactive and proactive inhibition in this type of learning.

Hypotheses

Five null hypotheses were framed for the present investigation. These are:

1. There is no difference between the high rigid and the low rigid individuals in the amount of proactive inhibitions experienced in a paired-associates learning paradigm.

2. There is no difference between the high rigid and the low rigid individuals in retroactive inhibition occurring in a paired-associates learning paradigm.
3. There is no difference between high and low rigid subjects in the number of trials taken to learn the first list.
4. There is no difference between the high and the low rigid subjects in the number of trials taken to learn the second list after learning the first list.
5. There is no difference between the high and the low rigid subjects in the number of intrusion errors.

The investigator had a plan to use the A—B, C—D paradigm for the main study and the A—B, A—D paradigm for the ancillary study. The reason of doing so was that a change of paradigm in the ancillary study compared with the one used in the main study would reveal how far such a change would affect the influence of the high and the low rigid groups in paired-associates learning.

Sample

Two hundred women students with the mean age of 17.4 (age range 16 to 21) from Sri Padmavathi Women's College, Tirupati, constituted the sample. All of them were in the first or the second year of undergraduate classes at the time of the commencement of the investigation and were residing in college hostels. Fifteen students were kept in reserve. Twelve students from the sample of 200 dropped out and three could not attend both RI and PI experimental studies. They were replaced by other 15 subjects from the reserve pool.

Tools

The test of behavioural rigidity devised by Schaie (1960) was used for measuring rigidity of behaviour. The time-limit is 30 minutes. It has three sub-tests and each sub-test yields two or more scores. These scores are combined to yield three factors scores : (i) Motor-congnitive rigidity—This score indicates the individuals ability to shift without difficulty from one activity to another and efficiently deal with cognitive or semantic types of restraints. (ii) Personality-perceptual rigidity—This indicates the individual's ability to adjust to new surroundings and to new cognitive and environmental patterns (iii) Psycho-motor speed—It is a measure of the individual's efficiency to cope with restraints of physical objects.

The second tool, i e the standard progressive matrices test developed by Ravers (1958) was used for measuring intelligence. Approximately

45 minutes are required for the whole test. The test-retest reliability coefficient (Pearson's r) was 0.94.

Two sub-tests, Verbal Meaning and Word Fluency of the Primary Mental Abilities (PMA) Test (age 11-17) were used to measure verbal ability.

Verbal paired-associates of three types, viz. nonsense-nonsense, word-nonsense and word-word were used for measuring PI and RI.

Six lists of paired nonsense syllables, each containing ten items were prepared. Three of them were used for PI study and three for RI study. Similarly, six lists of each word-nonsense and word-word paired-associates were also prepared and used.

Method

Each paired item was exposed for two seconds through an Argu Slide projector. The recall method was used. In this the stimulus word was exposed and the subject had to recall the response word.

In the experimental condition the first was presented and learnt by the subject to the criterion of one perfect recall. Then the second list was learnt and the time taken by the subject was noted down. Then again the first list was recalled and the recall score was noted down.

In the control condition the subject was given the third list to learn after a gap of one week. Then she was given an innocuous task, that is, cancellation task for the same time taken for learning the second list in the experimental series. Recall of the third list was compared with that of the first list. It gives the RI score of the subject.

In PI, the subject learnt the fourth list to a criterion of one perfect trial and the time taken was noted down. Then the subject learnt the fifth list. After an interval of 30 minutes recall of the fifth list was noted down. In the control condition the subject did the cancellation task for the same amount of time taken by her in learning the fourth list. Then she learnt the sixth list to the criterion of one perfect trial. After retention interval of 30 minutes recall of the sixth list was tested. The differences between the recall of the fifth list and gives the PI score.

Findings

1. There was no significant difference between the high and low (Motor Cognitives Rigidity (MCR) groups in PI of PA (nonsense-nonsense and word-nonsense) learning

2 There was a significant difference between the high and low MCR groups in PI of PA (word-word) learning.

3. There was no significant difference between the high and the low personality-perceptual rigidity groups in PI of PA learning.

4. There was no significant difference between high and low Psychomotor Speed Rigidity groups in PI of PA learning.

5. There was a significant difference between the high and low MCR groups in RI of PA learning.

6. There was no significant difference between the high and low personality-perceptual rigidity groups in RI of PA (nonsense-nonsense) learning.

7. There was a significant difference between the high and low Personality Perceptual Rigidity groups in RI of PA (word-nonsense and word-word) learning.

8. There was no significant difference between the high and low Psychomotor Speed Rigidity groups in RI of PA learning.

9. There was a significant difference between the high and low MCR groups in the number of trials taken to learn list 1 (word-nonsense PA) in an A—B, A—D paradigm.

10. There was a significant difference between the high and low MCR groups in the number of trials taken to learn list 2 after learning list 1 (word-nonsense PA) in the A—B, A—D paradigm.

11. There was a significant difference between the high and low MCR groups in the number of trials taken to learn list 2 after learning list 1 (word-nonsense PA) in the A—B, C—D paradigm.

12. There was a significant difference between the high and low MCR groups in the number of second list response intrusion errors while recalling the first list responses in the A—B, A—D paradigm.

13. There was a significant difference between the high and low MCR groups in the number of first list response intrusion errors while learning the second list in the A—B, A—D paradigm. [Abstract : Neerja Shukla]

Sampling in Curriculum Evaluation : Some Problems in Practice

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SAMPLING IS AN important feature of most social, educational and psychological research design. Perhaps the first comprehensive work dealing with both the theory and practice of sampling appeared in 1949 (Yates 1949) Other accounts of sampling procedures have since appeared (Kish 1954, Kish 1965, Stuart 1962, *inter alia*), but none seems to have been specifically concerned with educational research (Butcher 1965). Yet sampling is widely employed in educational research to produce valid and reliable generalizations.

Educational research design has a short history, but is of crucial importance in a field which is less susceptible than most to scientific study Laboratory method or experimental design is sometimes appropriate to educational research, not only because human behaviour is a fragile area to explore but also because the accusation often levelled against the educational researcher is that his work is not closely wedded to practice. However, circumstances in particular situations usually determine the sampling method, or combination of methods which should be employed. In this paper an attempt has been made to illustrate some problems of sampling by describing its application to a practical situation—the evaluation of a complex and open-ended curriculum programme.

The main purpose of the sample described in this paper was to draw enough pupils in order to explore with the use of psychometric measurement the range of effects of the Humanities Curriculum Project (Schools Council 1970) within the whole population. The Project, which was established in 1967 as part of a comprehensive programme, concerned with the raising of the school-leaving age, involved classroom discussion as a core element for teaching controversial issues (e.g. 'war', 'education', etc.) *to adolescent* pupils of average and below-average ability (Schools Council 1970).

The design of evaluation was implemented in the 1970-72 diffusion phase. Simple notions of curriculum impact seemed inappropriate in this context. The Project, and the system in which it operated, were too vulnerable to remain intact as it was disseminated throughout the country. The teaching materials were commercially published and sold in the open market—no control over their use could be exercised by the Project Development team. The Project was controversial and made heavy demands upon the time, energy and understanding of teachers and local authority personnel. The teacher was asked not to follow or find support from rules for teaching but invited to participate actively in testing experimental teaching strategies in classroom discussion.

The evaluation team worked on the assumption that distortion would be the rule rather than the exception. Although the pupil-measurement programme was a major feature of the evaluation it was combined with case studies of schools and local authorities in an attempt to gain an in-depth and comprehensive appreciation of the innovation at work. Thus, the evaluation design adopted a 'client-oriented' approach by taking into account the questions posed by Project decision-makers (teachers, local education authorities, project sponsors and others).

The Design of the Sample

The Project development team set a broad aim for the teachers but did not specify behavioural objectives (Stenhouse 1970). The aim was "to develop an understanding of social situations and human acts and of the controversial value issues which they raise" (Schools Council 1970). The question of what to measure had still to be decided. The evaluation team could not accept responsibility for extrapolating measurable dimensions. We put the question to teachers (about 50 in all) and members of the Project team who had taught and met Project pupils in the 1968-70 trial period when the teaching method and materials had been developed. Judgements which they made and which could be operationalized were regarded as hypotheses to be tested. A battery of 23 tests, covering over 40 dimensions was compiled to answer the following: What is the potential effect of the Project, if any, on pupils' personality traits, attainment levels in reading and vocabulary, academic and achievement motivations, interests, self-concepts, moral and social values, attitudes to school and parents ? The inventory included some standardized tests but others were either modified or newly devised and validated to accord with special demand. The inventory was a broad, exploratory vehicle, not a concise form of diagnosis (Verma 1971).

A carefully designed and comprehensive sampling exercise was required, involving a representative number of pupils. We had hoped to be able to generalize findings, based on psychometric tests, and say that the patterns discovered in the chosen sample were typical of the 'total population'.

A postal questionnaire survey was undertaken prior to sampling. It provided useful data for Project sponsors and clients about the type, environment and size of schools. This information also helped us towards stratifying the sample in order to make it more representative. The sample of pupils was drawn soon after the test-battery had been assembled and when a realistic response to the survey had been achieved. A description of the main features of the sampling exercise follows.

A National Sample

The diffusion of the Project was nationwide, arguing for a national sample design which involved pupils from many different cultural backgrounds. For example, the proportion of pupils who left school at the first opportunity differed significantly between regions of the country.

The Sampling Frame

The Project team mounted a national programme of dissemination towards the end of trial phase (1968-70). In the absence of control over the use of materials, the team devoted much time and energy in recommending and arranging in-service training courses to familiarize teachers with the method. The sampling frame (lists of diffusion schools) was divided into (a) lists of *trained* schools provided by local education authorities involved in the training network, and (b) lists of *untrained* schools listed by the Project publisher as having purchased materials.

A Two-stage Sample

A national two-stage sample of schools and pupils was drawn. By a two-stage sample, it was meant a sample of schools within which were drawn samples of pupils. The school was regarded as the first stage of the sampling unit for two reasons. Firstly the sampling frame consisted of schools, not pupils, since it was not feasible to list all Project pupils. Secondly, this ensured an even distribution of selected pupils across schools. Supposing we had drawn a one-stage sample of pupils, the burden of participating in the pupil-measurement programme would perhaps have been unequally shared among schools; three pupils, say, might have been selected from one school and fifteen from another.

Trained Schools

A sample of trained schools was drawn from all educational inspectorate divisions in England and Wales. It was stratified by school-type (comprehensive, grammar, secondary, modern and others) and was matched according to the environmental distribution of the national population (urban, non-urban and rural). Matching, not stratification, was employed because in the survey a few teachers were able to define the school environment.

Untrained Schools

Case studies of trial schools had indicated that the effectiveness of the innovation depended to a considerable extent upon the acquisition of skills by teachers in chairing Project discussions in the classroom. The survey showed that nearly half of all diffusion schools were untrained. In an attempt to evaluate the impact of teacher-chairmanship in these schools and whether it differed from trained schools, we drew a sample of untrained schools, comparable to trained schools, from all educational inspectorate divisions.

Trial Schools

Case studies had also suggested that the novelty of Project teaching methods seemed to have created pessimism on the part of many teachers. Therefore, a third group of all the trial schools in their third year of Project work was included in the experimental sample in order to test the relationship between HCP teaching experience and pupil-effect. These schools were not sampled. Thus, on the basis of information gathered about the pattern of adoption of the Project, we constructed a stratified random sample of schools, 96 in all.

Three Samples of Experimental Pupils

For reasons of time, expense and practicability, it was not possible for the evaluation team to get involved in the selection of pupils to be tested. Teachers were asked to draw a random sample of fourth and fifth year Project pupils in trained schools, stratified by age and divided equally by sex. They selected pupils randomly from each stratum beginning with those pupils whose surname began with a specific alphabetical letter, until the requested number of pupils had been achieved (alphabetical letters had been randomly allocated to schools). The same procedure was applied to draw a matched sample of pupils in untrained schools.

Experimental pupils in trial schools were sufficiently large in number to justify sampling procedures within each school. A random sample was similarly drawn of these pupils. It was divided equally by sex and stratified by age.

Two Samples of Control Pupils

Two matched samples of control pupils—internal control (non-Project pupils in the experimental schools) and external control in non-Project schools—were drawn in an attempt to isolate the independent variable, i.e. the Project teaching, and to ensure that any changes in dimensions covered by the measurement instrument could be attributed to it. The internal control mechanism is supposed to hold the school variable constant within the experimental sample. External control pupils were randomly selected from a small pool of non-Project schools which were known to us. Efforts were made to match these schools as precisely as possible, according to the type and environment of the trained school sample

Test Administration

The battery of 23 tests requiring nine hours to complete would have been too cumbersome and monotonous for individual pupils. We divided the tests into three batteries, and teachers divided the selected experimental and internal control pupils randomly into three groups so that each pupil would complete one of the three batteries. We thought that non-Project schools would be unable to devote so much time to the measurement programme, and hence a special battery of seven crucial tests was compiled for external control pupils.

The cost and length of the inventory was consequently reduced by two-thirds (with the exception of external control pupils) but the number of dimensions covered was retained. The size of the sample for each battery was effectively reduced, but its representativeness was not damaged in the same proportion, because the *primary* cell of the sample (a random sample of pupils grouped by age and sex) was divided randomly. This meant that the chances of each variable appearing in the same sample remained the same.

All selected pupils were tested twice, before and after a given period of Project teaching, to assess possible shifts on the dimensions defined by the tests. In the interim control pupils continued with their normal curriculum programme whilst experimental pupils participated in the Project. Two stages of post-testing were initially introduced in order to compare the effects of short-and long-term exposure to the Project teaching and this involved two different sets of pupils. The first, after a period of six months, mainly involved pupils leaving school at the age of 15 and the second, after 18 months, pupils staying on at school until the age of 16 or later.

Analysis

The measurement programme was ambitious and complex. It attempted to explore the impact of an open-ended curriculum innovation upon pupils. We asked teachers to sample and test a total of 3,500 pupils in over 100 schools. It was not surprising that the design of the sample proved complex and some fundamental errors resulted in the process, and they were of a kind which may plague much curriculum evaluation—and perhaps much action research.

Randomness, an essential ingredient in sampling, gives every unit of the population an equal chance of selection. Furthermore, it attempts to produce a representative sample and avoid bias (Cox 1958). In the present design, however, randomness played little part in the first-stage sample of trained and untrained schools. It played no part in the selection of trial and external control schools.

The response of diffusion schools to the National Survey was low. The percentages are given in Table 1. The use of stratification and matching procedures was made to ensure the proportional representation of such variable as school type, environment and regional location. These

TABLE 1

SCHOOL RESPONSE TO NATIONAL SURVEY

	Trained Schools *N=268*	*Untrainea Schools* *N=220*
No response	30%	45%
Response : Unwilling/unable to cooperate in evaluation	17%	15%
Response · Willing to cooperate in evaluation	53%	40%

further reduced the number of schools within each stratum. Few schools remained within each cell from which to select at random.

Randomness played a greater part in the second-stage sample of pupils in all schools. A sufficient number of pupils, grouped by age and sex, remained in each cell of the sample from which to select at random. All available evidence suggests that there are in-built biases which inhibit randomness (Yates 1949). Attempts were made, however, to reduce the bias of the teacher in his choice of pupils who were likely to perform well on the tests. Pupils were selected alphabetically, but were not split randomly into three groups. The burden of test administration already facing the teacher argued against imposing further sampling procedures.

The foregoing discussion about the representativeness of the sample does not complete the picture. Two questions arise : (a) How representative were diffusion schools of schools in general ? (b) How representative were schools willing to cooperate with the evaluation programme ? Within diffusion theory there is a school of thought which emphasizes the novelty of curriculum innovation. Its essential hypothesis is that an unrepresentative 'core' of the most 'progressive' schools first adopt the innovation, followed by the 'mass' of schools, if and when the innovation is seen to be successful (Carlson 1965). The Project as part of the raising of the school-leaving age, seemed likely to be adopted early by all kinds of schools confronted with alienated pupils for an extra year. Various local authorities were also likely to lend support, anticipating that they would be called to account for preparations made for this extra year at school.

The second question relates to the nature of response and non-response to the National Survey. The proportion of 'progressive' schools in the sampling frame cannot be precisely estimated. The concept, however, is ambiguous in the sense that some schools, because of their 'progressiveness', may be unwilling to take part in educational research. In National Surveys mailing is almost inevitable, and recognized as a major factor in non-response (Moser 1958).

The sampling frame in the present study was constructed from lists of schools supplied by local education authorities which was found to be more imprecise than might have been expected (Humble and Rudduck 1972). Sometimes it was wrongly assumed that any one school listed by its authority could be regarded as a 'trained' school These two factors could have contributed to incomplete and inadequate sampling frame. Case studies later conducted in the diffusion phase showed that in some 'trained' schools all teachers were not trained. Similarly, some teachers in 'trial' schools had no experience of Project teaching.

We might have considered a three-stage sample to distinguish between trained and untrained teachers within any one school, if the Project group had served as an intermediate sampling unit. But the Project group was not a convenient administrative unit for the sample. No sampling frame of Project group existed. They were not listed by the local authority, the Project publishers or by schools in the National Survey. Hence the assumption was made that the sampling frame of this study adequately distinguished between *trained* and *untrained*.

At the outset of the evaluation programme, some degree of non-response to tests was anticipated. An increase of approximately 15 per cent in the sample size of pupils proved inadequate (Table 2). Many factors perhaps played a part—lack of motivation on the part of testees, pupils-absenteeism and the burden of test administration. Other causes of discrepancy between numbers requested and achieved could be explained in terms of (a) failure of 27 schools to carry out the testing, and (b) inability of participating schools to provide the numbers requested

The measurement instruments were administered on a pre-and post-basis to the sample of pupils described earlier in this paper. The sample loss at the post-test stage was heavy (after six months' interval). The total number of pupils achieved at this stage for analysis purposes was 707, and this figure included experimental, internal and external control pupils The issue of non-response is inevitable in large-scale studies of this kind in which multi-variables are explored. Many factors probably played a part in this loss of sample-misinterpretation of instructions on the part of teachers with regard to test administration, lack of understanding on the part of pupils (resulting in incomplete tests), pupils'

TABLE 2

PRE-TEST RESPONSE

	Trained	*Untrained*	*Trial*	*External Control*	*Total*
Schools	30	23	19	15	
Experimental Pupils	662	475	720	—	1857
Internal Control Pupils	139	114	137	—	390
External Control Pupils	—	—	—	218	218

No. of pupils requested · 3600. This figure allowed for 'fall-out'
No. of pupils required · 3000
No. of pupils achieved : 2465

absenteeism on one or more of the testing sessions. However, one would be inclined to think that the burden of test administration played a major role in reducing the sample size from individual schools.

In theory the relationship between teachers and pupils selected in the sample ought to be stable during the period of teaching prescribed in the measurement programme. Changes in this relationship are likely to influence post-test results. In practice this stability could not be achieved. The diffusion process continued well after the sample was drawn, and an increasing number of teachers from untrained schools were introduced into the training network. Groups of pupils were likely to be recognized until and unless the innovation found a niche among other school curricula. Although these changes could not be controlled, they offer themselves as possible explanations for likely variations in test-results.

There seems to be as many sample designs as there are pieces of research. They vary according to the finance, personnel and time available, and to the purposes which researchers have in mind. But many have one theme in common—scientific expression. By this is meant research whose aim is to quantify and come to firm conclusions, however trivial. As often as not, however, it is 'scientism' which takes over, and means and ends become confused (Weiss and Rein 1969). The researcher and his audience are then left to sort out where the aim of the research left off and the preoccupation with method began.

Scientific expression is appealing enough to circumscribe the area of enquiry. Areas are sought which are scientifically manageable. If the enquiry is conducted on these relatively safe lines it will build upon traditions of research. If sampling is employed maximum use will be made of existing sampling frames. If a national sample is drawn a multi-stage sample will probably emerge—perhaps of constituencies, wards, households and individuals with households. The researcher will be able to predict the likely outcome of different lines of enquiry by referring to the existing archives of research on which his work is based (Nisbet and Entwhistle 1970).

We had no such advantages with the measurement programme. There were no means, for instance, of ascertaining that the Project training network would spread so unsystematically and provide teachers with more than one opportunity to be trained. We were working in the dark. It could not have easily been envisaged so early in the game that teachers within the same school had been trained differently, sometimes not at all. The sampling frame had to be constructed from guesswork.

Another feature of scientism is its ability to control. In essence it is a laboratory method in which the researcher defines the nature and pace of the exercise. This proved difficult in this study. For example, the response of local education authorities and teachers determined when the programme was launched. Teachers contributed in shaping the character of the test-inventory, and they had the largest part to play in its administration. The programme was 'consumer-oriented'.

The present programme did not measure up to the finest traditions of sampling but its concern was to describe some impact of a curriculum project. Sampling does not readily lend itself to exploring the impact of an open-ended curriculum innovation, especially if the innovation is implemented in various unpredictable ways. Responsibility then rests with the evaluator for making curriculum decision-makers more fully aware of the areas which cannot be precise but which are too important to ignore.

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Adolescence : A Calm or Stressful Phase of Development in India

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YOUTH REPRESENTS THE ENERGY of the present and hope of the future. Every society, therefore, has shown anxiety to keep the vitality of youth within bounds and direct it towards, taking up the responsibilities of adult life. In this context, the basic aspect of paramount importance is the proper understanding of adolescents and their problems by the society. It was estimated that in India, in the year 1961, there were 7,31,82,000 persons between the age range 15-24 years. In 1971 the number reached 9,05,30,000, the growth rate being 24.80 per cent per ten years. This means that the number will grow considerably during the latter half of the twentieth century. Thus, understanding of adolescents and their problems is crucial for the society.

There are disparate views regarding the stress of calm hypotheses of adolescence. G. Stanley Hall (1904) believed adolescence to be an era of inevitable turmoil. Studies by Tryon (1939), Symonds (1945), Hertzman (1948), Spivack (1956), Eissler (1958), Harris (1958), Gleerd (1961), Kaczkowski (1962) and Joseph (1971) also indicate that adolescence is a period, characterized by emotional insecurities or upheavals. However, opposite findings have also been obtained by several other writers. Douvan, Johnson and Burke (1955), Engel (1959), Johnson (1958) Ames, Matraux and Walker (1959), Hertz (1960), Coelho, Silber and co-workers (1963), Douvan and Adelson (1966) and Weiner (1973) found adolescence to be a peaceful and smooth phase of development. The present study is an attempt to identify the situation for adolescent girls belonging to a certain strata of society.

Hypothesis

In the present study adolescence was hypothesized to be a period of difficult adjustment for Indian urban adolescent girls.

Sample

The sample included 500 urban adolescent girls of 14 to 18 years o age. The varibales of education and socio-economic status were controlled The sample was randomly selected from five Hindi medium intermediate colleges of Lucknow city, coming under the control of Inspectress of Secondary Education, Lucknow

Tools and Procedure

Mooney Problem Check List (MPCL), adapted in Indian situations to which a quantitative dimension was added by the authors was employed for the purpose of data collection. Actually, MPCL does not measure the scope or intensity of students' problems in a way so as to yield a test score. Problems marked are not of equal significance : one item may be indicative of a substantial block in the life of an adolescent than a dozen others on which he may also have marked Besides, two adolescents marking the same problem may be experiencing it in different degrees. Therefore, for making the check-list appropriate for the present study, quantitative measures in the form of rank scaling were added to it. A scale of '0, 1, 2' was replaced for 'Yes'No' answers on each item. '0' signified that the problem was 'not at all' the students' problem, '1' signified that the problem was sometimes the cause of their worries and '2' indicated that the problem frequently caused worry in the students. The instructions were changed according to the response categories. To check the validity of the scoring system, pretesting was done on 40 urban adolescent girls. Having obtained satisfactory results in pretesting, the check-list was thought appropriate for the present research. The check-list was administered to 500 adolescent girls during their class periods and was collected immediately after completion. It took about 70 minutes to complete the check-list.

Results and Discussion

Two types of analysis-frequency analysis and score analysis, were done to obtain results.

TABLE 1

PERCENTAGE OF 'NO PROBLEMS' AND 'PROBLEM' SITUATIONS FACED BY ADOLESCENT GIRLS

	No Problem Responses	*Problem Responses*
	57.25%	42.75%
X^2=7.95 *		

*Significant above .01 level.

Table 1 shows that adolescence is by and large a peaceful period of development in India. Adolescent girls face problems in 42.75 per cent of their life situations, while in 57.25 per cent of their life situations they are able to meet without anxiety. Since there is a significant difference between 'no problem' and 'problem responses' by them, it indicates that adolescent girls are not overwhelmed by problems during their adolescence.

TABLE 2

PERCENTAGE OF PROBLEM SPAN AND PROBLEM INTENSITY OF AN AVERAGE ADOLESCENT GIRL

*Problem Span**	*Problem Intensity***
42.75%	14.86%

*Problem span : Number of problems marked.
**Problem intensity : Number of responses marked as '2'.

Table 2 shows that the problem span is 42.75 percent, indicating that out of 100 about 43 of the life situations are faced with worry by an average adolescent girl. However, it also means that about 57 per cent of the life situations are faced without worry by her. Further, these 43 per cent situations evoke worry in quite low intensity (14.8 per cent). Thus our assumption that adolescence is a stressful phase of development for Indian adolescent girls has not been substantiated in the present study.

TABLE 3

DISTRIBUTION OF ADOLESCENT GIRLS INTO SEVEN SUB-GROUPS ACCORDING TO PROBLEM LEVEL Z SCORES $\frac{(X-M)}{\sigma}$

Sub-groups	*Percentage of Adolescents in Each Sub-group*
Very high problem level (+3 and above)	0.2 %
High problem level ($+2\sigma$ to $+3\sigma$)	3 %
Above average problem level ($+1\sigma$ to $+2\sigma$)	13.6 %
Average problem level ($+1\sigma$ to -1σ)	68.22%
Below average problem level (-1σ to -2σ)	14.8 %
Low problem level (-2σ to -3σ)	0 %
Very low problem level (-3σ and below)	0 %

Table 3 shows that 68.22 per cent of adolescent girls possess average problem level, thereby indicating normal adjustment. About equal number of adolescent girls possess below average and above average problem levels, i.e. 14 8 per cent lying below and 16.8 per cent lying above the average problem level. It is olso interesting to note that there are no adolescent girls possessing low (—2σ to—3σ category) or very low (—3σ and below category) problem level. This shows that none of the adolescent girls possessed very good adjustments. On the other hand, adolescent girls possessing problem level higher than the average are distributed over all the three sigma points. Thus there are some adolescent girls (3.2 per cent) who have a bad time during their adolescence. However, they are very few in number and hence, not significant for the predictions in the present study. Therefore, we find that our hypothesis that adolescence is a difficult phase of adjustment for Indian urban adolescent girls has not been substantiated by the present results.

The present resultsimply that transition from childhood to adolescence is not a drastic change in the personality of the adolescent girls in India. The physical appearance of an adolescent girl may be more evident and in sharp contrast with the physical appearance of a late child. But, since adult status in the form of home responsibilities is provided to her during late childhood, physical events during adolescence, do not mean much socially for her.

There is no discontinuity in the training of the feminine role. Women are expected to remain dependent and play a relatively submissive role throughout their lives. Since the role is almost the same and the training is consistent and continuous, the experiences during adolescence are less threatening for the adolescent girls, and also, they are not unsure of their ability to cope up with their environment.

Since girls are assigned adult duties and status at a younger age, their needs for status and acceptance in the form of mutual trust and affection are fulfilled to a great extent. Adolescent girls are given some degree of responsibilities means that they are given some freedom to manipualate some part of their environment which results in the satisfaction of their desire for independence. Furthermore, whatever restrictions are imposed upon their behaviour, they are trained for them from the very beginning and hence the pressure of restrictions is not too taxing for them.

In India there is emphasis upon the suppression of sex drive no doubt. But the girls are habituated for them from the very beginning Art and music are thought to be good virtues for girls. Thus culturally accepted outlets are provided for the relaxation of sex drive.

Thus the study of the problem of adolescent girls indicates that, by and large, adolescence is a calm phase of development in India. Only 3.2 per cent of adolescent girls respond to the instinctive and psycho-social changes of puberty with stress and poor adjustment. Majority of the adolescent girls are well equipped to face the changes in their inner and outer environment in a well adjusted manner.

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Effect of Feedback upon the Teaching Skills of Teacher Liveliness and Recognizing Attending Behaviour

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IN MODERN SOCIETY where the rate of change and growth of knowledge, and growth of student population are very rapid, the work of the best teachers can be crippled if they are not encouraged to take up innovations in their teaching. The new pattern of education, development of new education techniques and teaching methods necessitate proper teacher education programmes to equip the teachers to fulfil their duties efficiently. A good deal of attention has been directed in recent years to the techniques of revitalizing classrooms in Indian schools. Considerable efforts have been made during the last decade through seminars, workshops, refresher courses, and summer institutes to introduce teachers to the new techniques of instruction. In spite of all these efforts, teaching in the schools generally confirms to a mechanical routine, with little or no insistence on concrete acquisition of classroom skills.

To improve the classroom instructional strategies, reorientation is needed in the teacher-training devices through which desired teaching skills could be developed in the in-service and pre-service teachers. Suitable techniques of training so as to develop technical skills of teaching which are applicable to any classroom situation, irrespective of the subject and level, must be incorporated in teacher education programmes. While planning for in-service teacher education attention should be paid to various aspects like finances available with the teacher, leave from the school, and proximity of the teachers' locality to the training institution, etc.

Another important aspect of the programme is, that which skills should be developed in the teachers. Among the various teaching skills applicable in the classroom situation, the skills of 'teacher liveliness' and 'recognizing attending behaviour' are of utmost importance without which classroom becomes dull and monotonous The skill of 'teacher liveliness' depends upon a number of factors, like the teacher's body movements, facial expressions, hand movements, voice modulations, ability in verbal and gestural focussing, strategic styles of interaction, and purposeful pauses, etc. No less important is the skill of 'recongizing attending behaviour' as it fosters discovery and eliminates boredom and slackness in learning This skill includes the detection of pupils' comprehension or bewilderment, the mode of checking pupils' attention towards the lesson and his varied activities and new instructional strategies in time with the pupils' reaction, etc.

Usually in all the training devices the most important factor involved in developing the skills is 'feedback'. A cluster of studies tested the proposition that feedback to teachers about their style of performance and about the effects on pupils will tend to increase their mastery of teaching skills. Steinen (1967) found that feedback from fellow student-teachers working in pairs and feedback from pupils were both found to be more effective than self-appraisal feedback by the student-teachers themselves. Pangotra (1972) found that interaction analysis can be an effective feedback mechanism; student-teachers who received interaction analysis feedback made significant gain in the predicted direction in their use of specific verbal behaviour. Heinrich and Mckeegan (1969) found that in immediate feedback group there was greater reduction in discrepancy between the teachers' self-perception about their performance in the class and the performance observed. But still it is to be studied that what kind of feedback is suitable for the Indian conditions. Some empirical studies should be undertaken to study the effect of different kinds of feedback.

The present paper is a report of an investigation which was undertaken to study the effectiveness of the different types of feedback in bringing about behavioural modification in in-service teachers with regards to the skills of 'teacher liveliness' and 'recognizing attending behaviour'.

Objectives

The objectives of the study were as follows :

1. To study the effect of cumulative feedback, simple feedback, and no feedback upon the skills of 'teacher liveliness' and 'recognizing attending behaviour'.
2. To study the occurrence of the skills at different stages, viz. in the beginning, in the middle and at the end of the lesson.

Tools

To study the effect of different kinds of feedback, the data required were collected through the following scales.

1. Lesson Evaluation Scale

The lesson evaluation scale was developed to measure how successful the teacher was in the use of the skills of 'teacher liveliness' and 'recognizing attending behaviour'. The lesson evaluation was divided into three parts: the beginning part, the middle part and the final part. The method of repeated observations enabled the feedback to be more precise and pin-pointed rather than a global and dismal one. Each of these sections was provided with blank space in the evaluation scale for writing observer's remarks with regard to the use of both the skills at the three different stages.

2. Evaluation Scale for the Skill of Teacher Liveliness

The evaluation scale for the skills of 'teacher liveliness' consisted of a rating scale with statements regarding the seven specific aspects of the skill 'teacher liveliness' on a seven-point scale ranging from 'not at all' to 'very much'. The statements consisted both verbal and non-verbal behaviour of the teacher. The specific aspects included in the scale were : body movements, facial expressions, voice modulation, verbal focussing, gestural focussing or a combination of both, interaction styles, short deliberate pause and shifting sensory channels.

3. *Evaluation Scale for Skill of Recognizing Attending Behaviour*

This evaluation scale also consisted of a rating scale with statements regarding the five specific aspects of the skills on a seven-point scale ranging from 'not at all' to 'very much'. The statements were regarding the instructional strategies made use by the teacher, such as the use of visual cues of pupils to note the indications of interest and comprehension, the use of questioning, changing pace in teaching, deliberate pause and use of varied activities according to pupils' reaction

Methodology

The study employed 3×3 factorial design with repeated measures. For the present study 12 teachers were selected as sample. They were from English-medium schools (higher primary and secondary). Out of twelve teachers six were from a high school at Bhavanagar and the rest belonged to a high school of Baroda. There were three matched groups in the study, each group consisted of four teachers. The matching was done on the basis of biodata of the subjects. The biodata consisted of age, sex, academic qualifications, teaching experience and status.

All the teachers included in the study were given instructions regarding the skills of 'teacher liveliness' and 'recognizing attending behaviour'. They were divided into three groups of four subjects each. Group I (E_1) was given cumulative feedback, Group II (E^2)was given simple feedback and Group III (C) was given no feedback. The treatments given were as follows.

1 *Cumulative Feedback Treatment*

The subjects belonging to E_1 group were observed of their performance in the classroom by the investigator on the basis of the skills of 'teacher liveliness' and 'recognizing attending behaviour'. Each observation consisted of three steps : beginning, middle and the end of the lesson. Thus, the observation was carried out for three times with emphasis on repeated observation system. At the end of each lesson the teacher was given self-evaluation scale to appraise himself and the investigator also rated the teacher as a whole. The teacher was provided with the feedback on the basis of the investigator's observations, ratings and self-appraisal, which was considered as cumulative feedback. The investigator collected the proforma of remarks given by himself and the self-evaluation scale from the teacher before starting the second lesson. The same process was carried out for all the three lessons.

2. *Simple Feedback Treatment*

This treatment was given to the subjects belonging to E_2 group The teachers were observed of their skills of 'teacher liveliness' and 'recognizing attending behaviour' at the three stages of the lesson. At the end of the period a self-evaluation scale was given to the teacher for his self-appraisal, but, in this case no remarks were given by the investigator at the end of each period of observation. The sheets of self-evaluation were collected before starting the second lesson. The same process was carried out for all the three lessons.

3. *No Feedback Treatment*

This treatment was carried out with the subjects belonging to C Group. The teachers were observed on the same skills and with the same stress on repeated observation. But, in this case neither they were given the self-evaluation scale nor they were made aware of the observations made by the investigator.

Data were obtained under three categories. The first category was based on the frequency of the skills under consideration observed by the investigator in the beginning, in the middle and at the end of the lesson. The second category was the assessment of overall performance of the teachers under study with the help of lesson evaluation scale The third category was the self-appraisal of each teacher.

The data was analysed by employing the technique of trend analysis to study the change in the performance of the skills with different trials and at the different stages of the lesson.

Results and Discussions

1. *The Skill of Teacher Liveliness*

To study the effect of different kinds of feedback on the skill of 'teacher liveliness' at the different stages of the lesson in the different groups the technique of trend analysis was employed. The results are presented in Table 1.

From Table 1 it could be studied that in the beginning part of the lesson, the F-ratio of groups of teachers was found significant at .05 level of significance, while the F-ratios of lessons (ss), and groups×lessons were found significant at .01 level. It was found that among the three

TABLE 1

ANOVA SUMMARY OF THE RESULTS RELATED TO THE SKILLS OF 'TEACHER LIVELINESS' FOR THE OBSERVATIONS OF INVESTIGATOR AND SELF

INVESTIGATOR			SELF		
Variables	*F-ratio*	*Significance level*	*Variables*	*F-ratio*	*Significance level*
A. Beginning Part of the lesson			Whole Lesson		
i. Groups of the Teachers (GSS)	8.01	S(.05)	(i) Groups of Teachers (GSS)	696.74	S(.01)
ii Lesson(SS)	76.71	S(.01)	(ii) Lessons(SS)	39.80	S(.01)
iii. Groups × Lessons	26.24	S(.01)	(iii) Groups × Lessons	16 45	S(.01)
B. Middle Part of the Lesson					
i Groups of the Teachers (GSS)	5.08	S(.05)			
ii. Lessons(SS)	32.23	S(.01)			
iii. Groups × Lessons	13.29	S(.01)			
C. Final Part of the Lesson					
i. Groups of the Teachers (GSS)	7.34	S(.05)			
ii. Lessons(SS)	15.59	S(05)			
iii. Groups × Lessons	7.13	S(.01)			
D. Whole Lesson					
i. Groups of the Teachers (GSS)	7.07	S(.05)			
ii.	59.40	S(.01)			
iii.	24.37	S(.01)			

GSS=Some square of groups of teachers
SS =Some square of lessons

groups, the progress in the performance of the skill 'teacher liveliness' was maximum in E_I Group. In the case of E_{II} Group also the progress was higher than C Group but the difference was not significant. As far as C Group is concerned, in some cases there was slight improvement and in some of the cases there was steady decline too. James (1970) also found that the combinaton of supervision with self-confrontation feedback was significantly superior to traditional supervision in getting student-teachers to move toward indirect instructional strategies. Roy (1970) found the four feedback strategies, viz. teachers' self rating, peers' rating, pupils' observations and FIACS improved the performance of the teachers to significant level.

In the middle part of the lesson, the F-ratio between the three groups was found significant at .05 level. The F-ratio of lessons (ss) and groups×lessons were found significant at .01 level. Among the three groups the progress in the performance of this skill was found to be maximum in E_I group and minimum in C group.

With regard to the final part of the lessons it was found that the F-ratio of the groups of the teachers and lessons (ss) were found significant at .05 level, while the F-ratio of groups lessons was found significant at 01 level. It was found that the progress in the performance of the skill 'teacher liveliness' was maximum in E_I Group. In the case of E_{II} group the progress was noticeable but in the case of C Group it was found that the performance was not changed to either side.

Regarding the 'whole lesson' it was found that the F-ratio of the groups of the teachers according to the investigator's observations was significant at .05 level whereas according to their self-evaluation F-ratio was significant at .01 level. The F-ratios of lessons (ss) and groups×lessons were found significant at .01 level according to the investigators as well as their self-evaluation

2. *The Skill of Recognizing Attending Behaviour*

To study the effect of different kinds of feedback on the skill of 'recognizing attending behaviour' at different stages of lesson for different groups, the technique of trend analysis was employed to compare the groups. The results are presented in Table 2.

From Table 2 it could be studied that in the beginning part of the lesson, the F-ratios of groups of the teachers (GSS), lessons (ss), and groups×lessons were found significant at .05 level. It means the groups differed significantly and the performance was found most in E_I Group and least in C Group. Acheson (1965) found that presence of a supervisor during the feedback of videotaped teaching led to significantly

TABLE 2

ANOVA SUMMARY OF THE RESULTS RELATED TO THE SKILL OF 'RECOGNIZING ATTENDING BEHAVIOUR' FOR THE OBSERVATIONS OF INVESTIGATOR AND SELF

Investigator			Teacher		
Variables	*F-ratio*	*Significance level*	*Variables*	*F-ratio*	*Significance level*
A. Beginning part of the lesson			Whole Lesson		
i. Groups of the teachers (GSS)	5.65	S(.05)	i. Groups of the Teachers (GSS)	250.77	S(.01)
ii Lessons (SS)	12.65	S(.05)	ii. Lessons	30.70	S(.01)
iii. Groups × Lessons	8.25	S(.05)	iii. Groups × Lessons	8.40	S(.01)
B. Middle part of the lesson					
i. Groups of the Teachers (GSS)	4.01	N.S.			
ii. Lessons (SS)	37.38	S(.01)			
iii. Groups × Lessons	27.76	S(.01)			
C Final part of the lesson					
i. Groups of the Teachers (GSS)	11.06	S(.01)			
ii. Lessons (SS)	4.48	N.S.			
iii. Groups × Lessons	2.96	S(.05)			
D. Whole Lesson					
i. Groups of the Teachers (GSS)	9.44	S(.01)			
ii. Lessons (SS)	51.91	S(.01)			
iii. Groups × Lessons	27.08	S(.01)			

more reduction in teacher monologue than did viewing of the videotapes by the student alone

Considering the final part of the lesson, the F-ratio was found significant at .01 level whereas, in lesson (ss) it was not found significant and again it was found significant in groups×lessons at .05 level.

Regarding the whole lesson it was found that the F-ratio of groups of teachers, lessons (ss), and groups×lessons were found significant at

.01 level according to the investigator's observations as well as by their self-evaluation. It means groups differed significantly in the performance of the skill 'recognizing attending behaviour' and the performance of E_1 Group was found maximum and whereas it was least in C Group. Tuckman, McCall and Hyman (1969) found that merely knowing the system of interaction analysis was not sufficient to induce change in teachers' classroom behaviour. Verbal feedback from another person had to be added to the self-observation before changes were achieved.

Conclusions

Summarizing the results regarding the effect of feedback upon the teaching skills of 'teacher liveliness' and 'recognizing attending behaviour' it could be concluded that the cumulative feedback is more effective than the simple feedback, because E_1 group performed maximum at all the stages in all the lessons and the groups differed signalicanctly at .01 level as far as the whole lesson and the skill of 'teacher liveliness' is concerned. In the case of the skill of 'recognizing attending behaviour' in the middle part of the lessons, the groups did not differ significantly although the performance was in favour of E_1 group. The different trials have the positive effect in the performance of both the skills as F-ratios of the lessons (ss) were found significant (in some cases at .05 level and in some at 01 level) The skills were used to a greater extent in the middle of the lesson.

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Identification of Backward Regions in Secondary School Leaving Certificate Examination by 'Success Chart' Technique

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THE PROPORTION OF SUCCESS under study is that of the results of students who appeared for Secondary School Leaving Certificate Examination in various districts of the State of Tamil Nadu in March 1976. The results of the candidates who appeared through institutions only are considered for this study. These data together with the calculated proportions of success are shown in Table 1.

Theory

Let us consider the data of 15 districts. n_i and D_i $(i=1 \text{ to } 15)$ denote the number of candidates who appeared and among them who have passed examination in the ith district. Consequently $P_i=\frac{D_i}{n_i}$ gives the proportion of success in the ith district. One method of estimating the average proportion of success at the state level would be to find $P=\sum_{i=1}^{15}\frac{P_i}{15}$, which is nothing but the simple arithmetic mean of the different proportion of success. Had the number of candidates who appeared

TABLE 1

SUCCESS AT THE SECONDARY SCHOOL LEAVING CERTIFICATE
(March 1976)

Name of the District	*Number Appeared*	*Number Passed*	*Proportion of Success* $Pi = \frac{Di}{ni}$
Madras	17720	10173	.5737
Chingleput	13194	6300	.4774
South Arcot	11847	5946	.5018
Thanjavur	16681	9362	.5612
Madurai	16779	12496	.747
Ramanathapuram	11844	3367	.7064
Tirunelveli	13602	10101	.7476
Kanyakumari	10092	5539	.5488
North Arcot	15321	6768	.4417
Salem	10959	7770	.7090
Tiruchirapalli	14326	8639	.6030
Pudukottai	2608	1310	5023
Dharmapuri	3704	2003	.5407
Coimbatore	17469	12281	.7030
The Nilgiris	3087	1496	4846
Total	179233	108551	.6056

for the examination in each of the districts been the same, the P would have been a valid estimate of the average proportion of success As the number of candidates who appeared vary from district to district, according to the theory of statistics, the better estimate for the proportion of success is Pw, which is nothing but the weighted arithmetic mean Pi's where the weights being the number of candidates who appeared in each of the district. Hence the estimate of proportion of success for constructing 'success chart' is

$$Pw = \frac{\sum_{i=1}^{15} niPi}{\sum_{i=1}^{15} ni} = \frac{\sum_{i=1}^{15} Di}{\sum_{i=1}^{15} ni}$$

It is clear from this that Pw can be directly estimated from ni's and di's without calculating separately the Pi's of the various districts.

It has been pointed out in the beginning that variation in the proportion of success is due to many factors. These factors may be classified as assignable and non-assignable causes of variation, a concept which has been very widely used in industrial statistics and quality control. The non-assignable cause is know as 'system of chance causes' which is inherent in the system itself. The Success Chart for the portion of success, which is free from the assignable causes of variation, which is similar to that applied in the field of quality control, is considered provided that ni and di are known. The usual 3-sigma control limits, namely for the Pw may be calculated by using the formula :

$$\text{UCL} = Pw+3\sqrt{\frac{Pw\,(I-Pw)}{N}}, \qquad \text{where } N=\sum_{i=1}^{15} ni$$

$$\text{LCL} = Pw-3\sqrt{\frac{Pw\,(I-Pw)}{N}}$$

Pw chart may be drawn in a graph sheet, which is known as proportion success chart. The upper control limit in this case is termed 'upper success limit' and lower control limit is termed as 'lower success limit'.

Once the construction of success chart is over the actual observed proportion of success in each of the districts should be plotted in the chart, to identify the regions which are backward. The districts whose proportions fall below the lower limit need our immediate attention, to analyse the causes of variation and the districts which are above the upper limit need no special attention, since they are well above the state proportion of success. Also the districts which fall within these limits can also be considered to be well within the state level of achievement.

Success Chart (Combined)

The Pw proportion of success, namely Pw is .60560 and the lower and upper limits for the Pw chart are as follows :

$$\text{LSL}=Pw-3\sqrt{\frac{(I-Pw)\;Pw}{N}}$$

$$\text{Where N being } \sum_{i=1}^{15} ni$$

$$=.60560-3\sqrt{\frac{(I-.60560)\;(.60560)}{.179233}}$$

$$=.60212$$

$$\text{USL}=.60560+3\sqrt{\frac{(I-.60560)\;(.60560)}{17923}}$$

$$=.60908$$

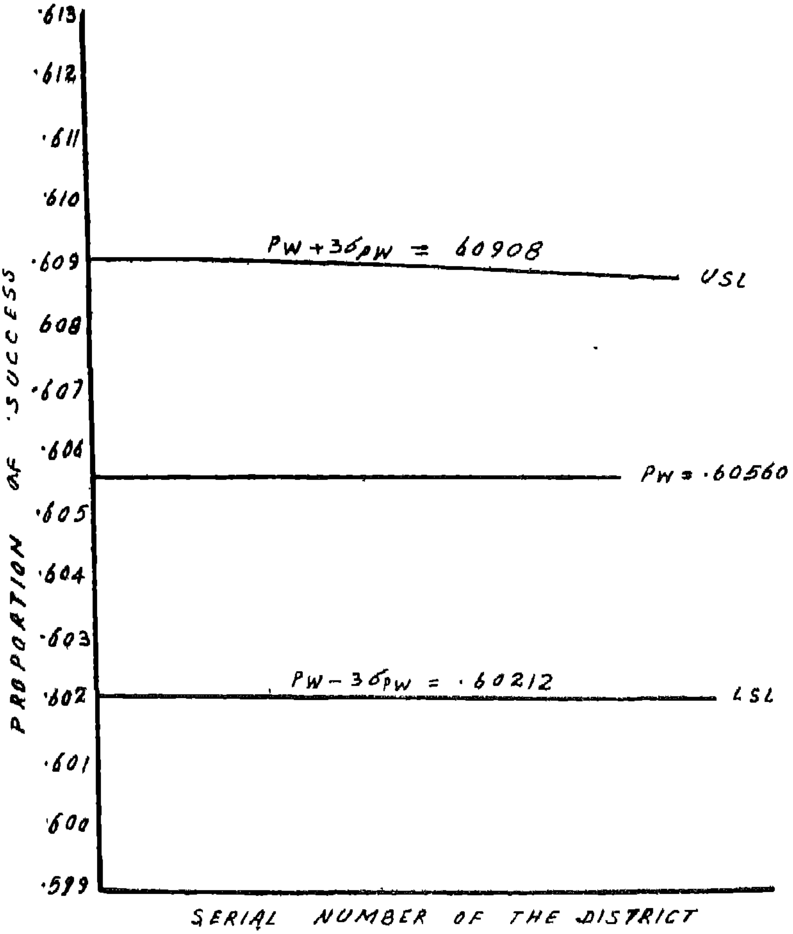

CHART 1

SUCCESS CHART OF Pw

If the observed proportions are plotted on a chart, it would be observed that Chingleput, South Arcot, Thanjavur, Kanyakumari, North Arcot, Pudukottai, Dharmapuri and The Nilgiris fall below the lower success limit which need immediate attention to improve their position after analysing the cause of the large-scale failure in these respective districts.

Further analysis of the examination results shows that apart from the variation among the district, there is variation even among boys' and girls' success within the district itself. It is, therefore, essential to construct separate success charts for boys and girls to identify, whether the above districts are backward regions only in respect of boys or girls or both.

TABLE 2

PROPORTION OF SUCCESS OF BOYS AND GIRLS

Name of the Revenue District	Boys			Girls		
	No. Appeared	*No. Passed*	*Proportion of Success*	*No. Appeared*	*No. Passed*	*Proportion of Success*
Madras	10,178	5,411	.5317	7,542	4,762	.6314
Chingleput	9,178	4,032	.4393	4,016	2,268	.5647
South Arcot	8,930	4,193	.4695	2,917	1,753	.6009
Thanjavur	11,654	6,184	.5306	5,027	3,178	.6321
Madurai	11,007	7,901	.7178	5,772	4,595	7960
Ramanathapuram	8,325	5,675	.6816	3,519	2,692	.7649
Tirunelveli	9,075	6,522	.7186	4,527	3,579	7905
Kanyakumari	5,871	3,184	.5423	4,221	2,355	.5579
North Arcot	11,305	4,664	.4125	4,016	2,104	.5239
Salem	7,590	5,341	.7036	3,360	2,429	.7209
Dharmapuri	2,639	1,402	.5312	1,065	601	.5643
Tiruchirapalli	9,751	5,407	.5545	4,575	3,232	.7064
Pudukottai	1,913	909	.4751	695	401	.5769
Coimbatore	10,788	7,413	.6871	6,681	4,868	.7286
The Nilgiris	2,013	931	.4624	1,074	565	4740
Total	120,217	69,169	.5754	59,016	39,382	.6673

Success Chart for Boys

The proportion of success for boys at the state level is $P^B_W = .5754$ and the lower and upper success limits are as follows :

LSL ($P^B w$) = .57111
USL ($P^B w$) = .57969

The following districts, namely Madras, Chingleput, South Arcot, Thanjavur, Kanyakumari, North Arcot, Tiruchirapalli, Pudukottai, Dharmapuri and The Nilgiris, whose proportion of success falls below the LSL of boys are considered to be backward regions in respect of boys.

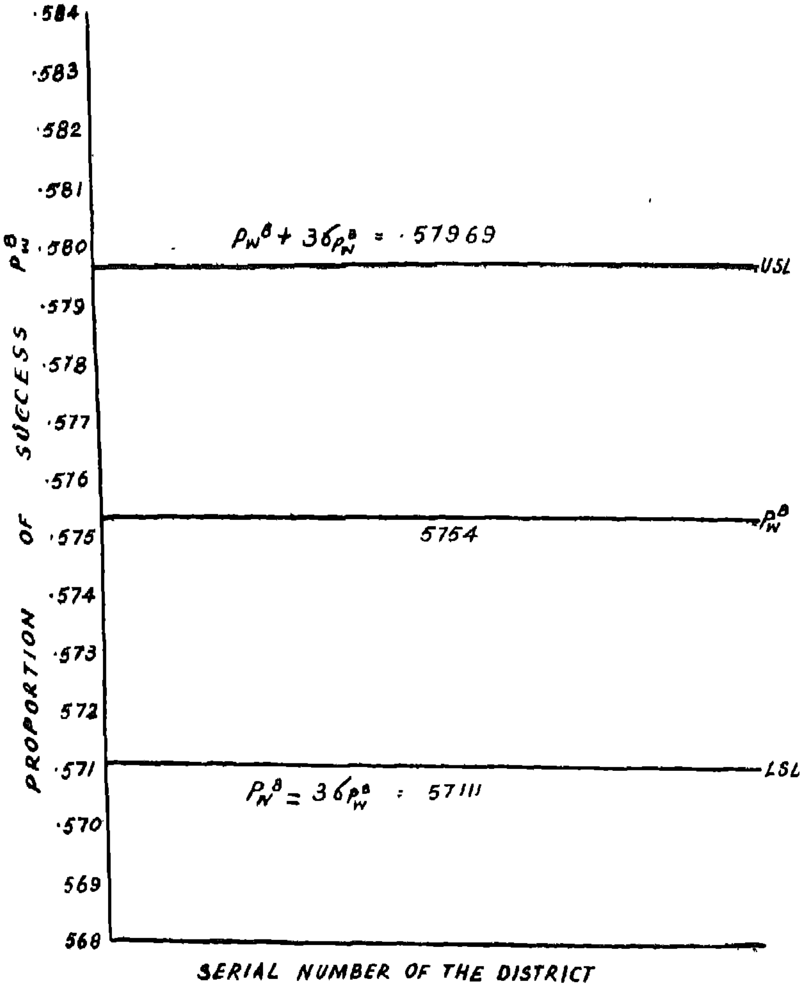

CHART 2

SUCCESS CHART FOR BOYS

Success Chart for Girls

Similarly, the proportion of success for girls is P^G_W =.6673 and then lower and upper success limits are as follows :

LSL=.6673—.3 (00194)=.66148
USL=.6673—3 (.00194)=.67312

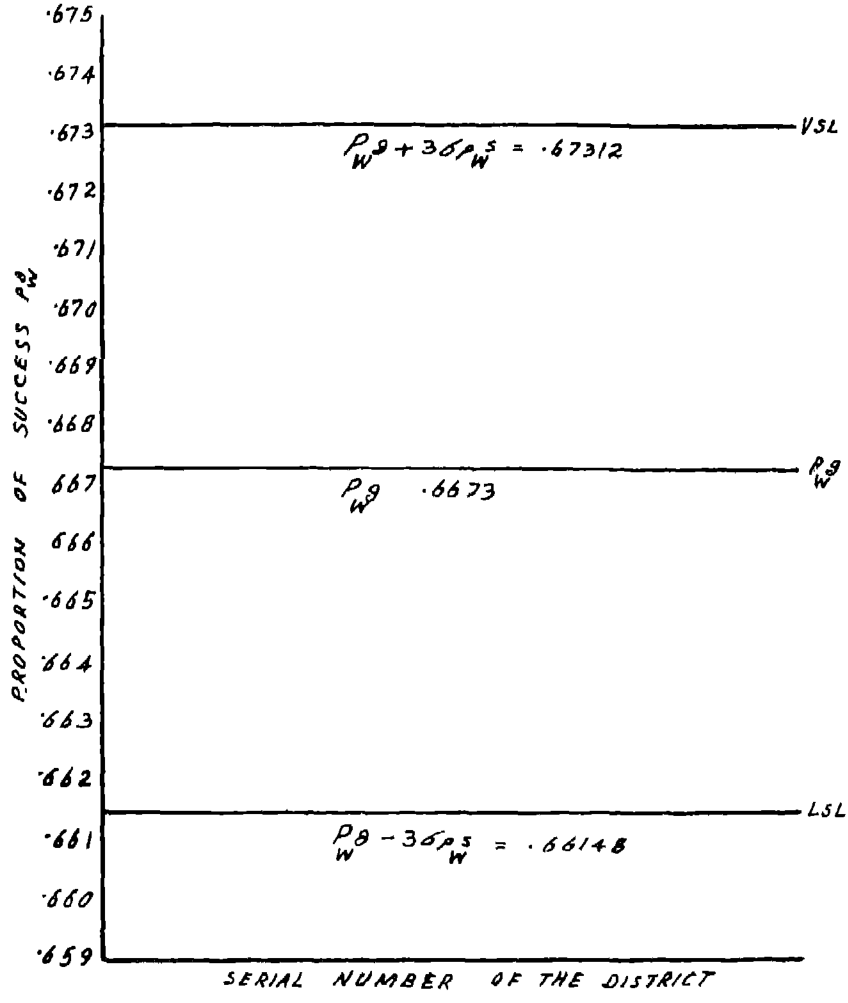

CHART 3

SUCCESS CHART FOR GIRLS

The districts whose proportion of success which fall below the lower control limit of the above P^G_W Chart are Madras, Chingleput, South Arcot, Thanjavur, Kanyakumari, North Arcot, Dharmapuri, Pudukottai, and The Nilgiris, are considered to be backward regions in respect of girls' performances.

From this it is clear that it is possible to classify the districts according to the following three groups :

1. The regions which are backward both for boys and girls.
2. The regions which are backward in respect of boys only.
3. The regions which are backward in respect of girls only.

TABLE 3

PROPORTION OF SUCCESS AND ITS UPPER AND LOWER LIMITS

	Pw.	*Pw*	*LSL*	*USL*
Boys and Girls (Combined)	6056	.00116	.60212	.60908
Boys	.5754	.00143	.57111	57969
Girls	.6673	.00194	.66148	.67312

In this connection, it is pointed out that the above approach can be applied to identify the regions which are yet to fulfil the constitutional objective of providing universal primary education. □□

Book Reviews

Educational Development in Sri Lanka

Educational Policies and Progress [During British Rule in Ceylon (Sri Lanka) 1796-1948]. J. E. Jayasuriya, Associated Educational Publishers, P.O. Box No. 603, Colombo, Sri Lanka, pp. 543+16. Price : Not given.

THE PRESENT BOOK is a historical-cum-critical study of the educational development in Sri Lanka since its known history. The Sinhalese claim themselves to be descendents of an Aryan Prince, Vijaya, who came over to Sri Lanka in about 485 B.C. along with his 700 followers. This prince was married to the daughter of king of Mathura—a Pandyan Kshatriya. The other phase witnessed attempts by South Indian kings to annex Sri Lanka Until fifteenth century they resisted Tamil attacks but thereafter they caved in. Around eighth century Muslims also entered Sri Lanka but remained confined to a few pockets in the country. The Portuguese, the Dutch and finally the British came and conquered Sri Lanka through their now well-known technique of trade, commerce and then conquest and for the all-too-familiar reasons of being useful for the Empire.

Sri Lanka inherited from its past a highly developed Buddhist system of education—a system strong enough to have survived, however meekly, through constant political challenges and rigors of time. Indians, comparing the Indian system of Buddhist education, may read the present book with profit. They would notice that the Indian Vihars were open to laity from the beginning and that monks knew a craft in addition to their knowledge of religious scriptures. They may also notice with some degree of surprise that the Buddhism gave Sri Lanka religion but no script until eighteenth century B.C. when its need became so very essential for the survival of religion. Pali was imported which came to enshrine in course of the religious learning.

Sri Lanka also inherited Hindu, Muslim and Western institutions of learning. The British took over Sri Lanka from the Dutch hands under an excuse of having conquered it while the truth was that Stadtholder of Holland was made to sign a document during his refuge in England from Napoleon. The 1796 entry into Sri Lanka was finally put an international seal on in 1802.

Sri Lanka at the time of British entry had two highly developed systems of education—The Buddhist and the Hindu, while the third, Muslim system, lived on in pockets. In 1804 Rev. James Cordiner had admitted that "the greater part of the men can read and write". The British rule bequeathed Sri Lanka Western learning but at the cost of their indigenous education, religion and many healthy traditions.

We know in India the role Wilberforce and Co. played in spreading Christianity among the pagans of both India, Sri Lanka and elsewhere. We also know how educational expenditure was cut down in favour of military expenditure and how English and Christian Missionaries played havoc with ancient 'pagan' cultures throughout the British Empire. This tale is told in brief in this otherwise long though fascinating treatise. Ceylon had its own 'down-filtration' theory and a Macaulay. Compare Indian experience with the following :

(a) "The honourable ambition of the upper classess of natives will be safely gratified, and the great mass of the people will be bound by ties of affection to a government which ceases to withhold offices of power and emoluments from its native subjects, as soon as they become qualified to fill them with advantage to the native community'; and also selected students be sent to England for their higher education so that in due course "respectable individuals connected with England by education and by office; and connected by ties of blood with the principal native families in the country" (Governor North)

(b) Colebrooke commended "the importance of rendering the English language the general medium of instruction".

The interesting part of the story is that the British started taking over the educational system and went an reducing their financial support for one reason or other. Therefore in place of the rate of literacy going up, it went down in effect. By 1853 it had been decided that in Sri Lanka Hindu, Buddhist and muslim institutions would receive no grant-in-aid at all. That is how the institutions of local origins gave way to the foreign ones even as the indigenous schools in India were made to die as against others supported by the government.

A most fascinating and revealing book and a must for all those specializing in Comparative Study.

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Education in Orissa

Education in Orissa : A Study in Selection and Allocation Process. Alan Sable. S Chand & Co., New Delhi, 1977, pp. viii+281, (cloth). Price : Rs. 50 00.

THERE ARE SEVERAL LARGE GAPS in educational statistics in India. So studies in education with primary data are of significant value. The *Education in Orissa* is one of them. This book is a revised version of the author's doctoral dissertation 'A study of educational selection and allocation in an Indian state capital', submitted to the Department of Sociology, Harvard University in 1973.

Since the title is too broad, it may be necessary to point out that (a) this work is a case study of the city of Bhubaneswar, where data has been collected by means of a stratified sample during January 1966 through June 1967 ; (b) this work is concerned with school education only ; and (c) this work does not cover all aspects of education in the city, but only those linked with the problem of attrition patterns and causes of attrition.

The book is divided into two parts : Part I describes and analyses the patterns of enrolment and attrition in the schools in Bhubaneswar and Part II deals with the causes and dynamics of high school attrition. Part I consists of four chapters and Part II has five chapters.

The reader is introduced to the structure of schooling in the city in Chapter I. An analysis of social composition of school enrolments by caste and by parental occupation has been given in Chapter II. Chapter III presents socio-academic characteristic features of the schools of the city. The author has classified the schools into three categories : English-medium schools whose clientele include "disproportionately large number of the wealthy and privileged", the Neighbourhood schools whose clientele reflect "the socio-economic composition of the areas in which these schools are situated", and the Enclave schools which are "more like a cow-shed than a school' . The author analyses the composition of the students and the teachers in all these three categories of schools separately. Chapter IV is devoted to an analysis of the patterns of attrition in the primary and the secondary schools of Bhubaneswar. He found that (i) attrition rates are high in the case of tribals and Harijans as against Brahmins, Karans and other middle castes ; (ii) attrition rates are high in the case of children whose fathers are labourers as against the children of the government servants and enterpreneurs ;

and (iii) attrition rates are the highest in the Enclave schools, while the rate is the lowest in the English-medium schools. Thus Part I is devoted to an exposition of the problem in general.

In Part II the author probes into the causes and dynamics of attrition at the high school level. A stratified sample of drop-outs has been drawn for this purpose and a lenghty questionnaire completed. The sources of attrition are identified in Chapter V. The details of the sample survey are presented in Chapter VI. After a detailed and lengthy analysis of the interactional bases of attrition in Chapter VII, it is found that the absence of father-son interaction, supportive of learning, generates attrition. The attitudes of the students, fathers, and teachers that influence attrition and retention are described in Chapter VIII. Chapter IX is devoted to the presentation of main findings along with their implications and limitations and suggestions for further research.

Education in Orissa, on the whole, is an excellent study. It focusses light mainly on two issues : inequality in educational opportunity, and rates of attrition. There is not a great deal a reviewer can say about such an excellent presentation. The book has its own intrinsic value to help planning in education. A welcome addition to the existing literature.

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The Printed Media

Print and Prejudice Sara Goodman Zimet. Hodder and Stoughton, in association with the United Kingdom Reading Association, 1976, pp. 144.

THE VOLUME HAS BEEN divided into four parts which are further sub-divided into ten smaller chapters. Part I of the book deals with the influence of the printed media on attitudes towards people. Part II explains the influence of the printed media on reading achievement. Part III throws a new light on the politics of print. Part IV of the book contains only one chapter on 'Print and Prejudice in Britain Today' and has been written by Mary Hoffman.

The interaction between the reader and the printed message is a complex one which only a few researchers have attempted to investigate. Since reading is the tool for learning other subjects, its role becomes all the more important. Even the most 'turned off' adult reader feels the need for reading at some special occasions.

In the first part Zimet has tried to emphasize that while our attitudes, values and behaviours may be influenced by what we read, when left to our own initiative 'we read what we are'. In other words, we select our reading to support our predispositions rather than in order to change them. Going ahead in the area, the author also gives evidence supporting the opposite viewpoint. Through the conscious control and presentation of specific content, the attitudes and behaviour of children and adults are modified in predicted directions, demonstrating, in effect, that, 'we are what we read'. The circumstances under which the reading is done then, will determine which will have the greatest impact, the reader or the printed passage. Print has a strong effect on the attitudes. When characters belonging to minority groups were presented in a favourable light, the attitudes of readers moved in a positive direction; when characters belonging to minority groups were presented in an unfavourable light, attitudes of readers moved in a negative direction. The important role played by follow-up discussions was also clearly demonstrated. Print is really very powerful in the sense that it influences the behaviour of individuals. In a free and open society, many divergent opinions can be and are openly expressed. The question of bias in news reporting then, must be a matter of increasing concern.

As far as the influence of the printed media on reading achievement is concerned, Part II takes care of it. The writer recommends that textbook content appropriate for boys and girls, together and separately be written-one that reflects equally their life style, interests and occupations. The evidence highlights the fact that children can learn to read emotional, personally meaningful words more easily than neutral words. In fact, young children are capable of learning to read and remember long as well as shorts words of mid-and high-frequency usage which are high in emotional value and meaningfulness to them. The author points out that both story-content and word-content are significant factors in reading achievement.

As for the 'Politics of Print', Zimet looks at how prejudice finds expression towards people of colour and social class groups. This third part of the book provides valuable insights into the impact that such content is likely to have on the development of a positive self-image on the part of those represented or misrepresented. As far as censorship and intellectual freedom is concerned, some of the conflicts between advocates of tight control and proponents of free access of the printed media are described Suggestions have been given for steps which schools and libraries should take if they wish to ensure intellectual freedom.

Part IV concentrates on the racial, sexual and social class content of children's reading materials in Great Britain. In fact, these are the three aspects which have been most studied in Britain. In the year 1947, Kenneth and Mamie Clark carried out their classic study of racial identity in Black and White American children. They showed the children black and white dolls and, in response to the request, 'Give me the doll that looks like you', 33 per cent of Black children chose the white doll. This reluctance in Black children to accept their own racial identity has been followed up by many studies in many cultures. A recent British study by Milner (1975) examined culture-specific differences in self-attitude between West Indian and Asian immigrants to Britain As in Clark study, children were given a choice about their actual identity ('Which doll looks most like you' ?). Of the 300 children in the sample all the White ones identified with the white doll, and so did 24 per cent of Asians and 48 per cent of West Indians. This was in spite of the fact that the dolls had been specially and carefully made to approximate to the features of each racial group. When asked about their ideal identity ('If you could be one of these dolls, which one would you rather be ?'), no White children chose outside their own racial group ; 65 per cent of the Asians and 82 per cent of the West Indians chose the white doll. What can be the reasons for this ?

The factors behind this rejection of racial self-identity in British immigrants are much too complex to assign to any one cause, but Milner and others regard literature, and particularly children's literature, as an important influence.

Regarding print and sexual prejudice Lobban coded the content of six British reading schemes. She found that the activities of the two sexes were rigidly differentiated in all the schemes. They showed a world more rigidly patriarchal, than the one they have at present. In updating her survey to include two more recent schemes, 'Language in Action', and 'Pirates', Lobban found no single instance of a working mother. The ratio of male to female characters in the two schemes was 5 to 1. She concludes : "Children need preparation for present day and future reality but these reading schemes prepare them for a reality of twenty years ago." A survey on children's books carried out by the Labour Party Women's Advisory Committee (1975) showed women cooking and cleaning eight times as often as men in the text and six times as often as in pictures. Men were shown doing repairs eight times as often in the pictures and four times as often in the text. The boy/girl activities demonstrated a similar pattern of rigid role differentiation. Brennan's work shows that even when females were the central characters in picture books, they were often silly, frivolous, feeble or just 'good'. In fact they are not often shown doing anything other than housework and shopping. 'The fact that in Great Britain over eight million women (and two out of every five mothers) work out of the house almost never enter into world of picture books', remarks a discussion statement issued at the Exeter Conference (1974) regarding children's books in education.

What if Black children do not find any racial identity in the books they read ? Does it make any difference for girls to see themselves depicted as a minority group when they represent slightly over half the child population ? There are no clear-cut answers to these questions ; but one thing is certain, when the readers find no positive images to relate to in the literature which they are offered as children, they are more likely to become alienated from books and thus from education in general.

The book draws the atteniton of teachers, writers of the textbooks and all those who are concerned with the education of children, to the different kind of bias that can be found in print. A number of studies of ways in which biased text may influence children—their attitudes and achievements—have been mentioned. Since the print in the form of books, newspapers and magazines reflect the various kinds of bias that already exist in the society, they can profitably be used as a starting point for modification of behaviour, for creating an optimistic outlook and as a means of raising overall awareness.

G C. AHUJA, Reader-cum-Research Officer, Central Institute of Indian Languages, Mysore. □□

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A QUARTERLY JOURNAL OF EDUCATIONAL RESEARCH

INDIAN EDUCATIONAL REVIEW

VOLUME FOURTEEN NUMBER THREE JULY 1979

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Literacy, Education and Agricultural Productivity in India

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In this paper an attempt is made to focus light on the problem of agricultural productivity and the impact of literacy and education on it. The study finds that literacy and education do enter into the agricultural production function and they are not less significant variables than the traditional factors. The study also examines the importance given to and the problems involved in the growth of education in rural India. The author opines that there is a large scope for reforming the curriculum towards productivity-orientation without much radical reforms

FROM THE VERY DAYS of the development of economic doctrines economists started enquiring into the nature and causes of the wealth of nations. The mercantilists viewed that trade was the only source of economic growth. Land was identified later as the important factor of economic growth during the days of the physiocrats. By the end of the eighteenth century the classical economists came out with a new theory of economic growth in favour of capital. The Marxian economists sang hymns in praise of labour. By the beginning of the twentieth century entrepreneurship has been the honoured factor in the theory of growth. At the beginning of the second half of the century the crown was captured by the educational economists led by Theodore Schultz. Since then economists have been busy in trying to estimate exactly the contribution of education to economic growth.[1] After nearly a decade, economists have started finding the contribution of education to rural development in general and to agricultural growth in particular.

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*The author owes his interest in the subject to Prof. B. Sarveswara Rao. He also gratefully acknowledges the help, guidance and encouragement received from Profs. S.N. Mishra, J. N. Sinha and H. N. Pandit. However, the author alone bears the responsibility of the opinions expressed in this paper.

[1] For a brief survey of the approaches and the empirical research done in India in this direction, see Tilak (1977a).

As high as 40 per cent of national income in India comes from agricultural sector. Agriculture is the most dominant activity with seven out of every ten persons depending on it as the main source of livelihood. Since the turn of the century this figure has been almost constant; 68.7 per cent of the working population is engaged in agriculture in India. The corresponding figure in advanced economies is very much less—around 5 per cent. At the same time Indian agriculture has been characterized with low level of productivity—productivity per hectare of land as well as per worker. Even though there are marginal improvements in recent years in productivity, still it is perhaps the lowest in the world. In this paper an attempt is made to focus light on the problem of agricultural productivity and the impact of literacy and education on it.

Section II is devoted to a brief survey of the research done in this regard both in India and abroad. Our main results of the analysis about the education's contribution to agricultural growth in India are presented in Section III. Section IV throws some light on the trends and the problems involved in the development of education in rural India. Some measures to solve the problems have also been suggested.

II

Table 1 shows state-wise agricultural productivity for the years 1960-61 and 1970-71. It brings out the differences in productivity in different states between the two time periods. One may be tempted to conclude looking at the table that there is a lot of improvement both in the productivity per worker and productivity of land during the decade; in states like Gujarat, Haryana, Jammu and Kashmir, Kerala, Karnataka, Orissa, Rajasthan, Tamil Nadu and Uttar Pradesh the productivity is more than doubled, while in the Punjab it has increased nearly by three times, and even in other states there is definite improvement. Similar observations can be drawn with respect to productivity of land. But this is not correct. During the same period the wholesale price index of food articles went up by 100 per cent, and that of all the commodities by little less than that. Thus, if we look at productivity trends at constant prices, the improvement is not that significant.

It is useful to investigate into the factors that account for differences in productivity. Productivity per worker, according to the 'traditional economists' who treat labour as "a capacity to do manual work requiring little knowledge and skills" and who view that literacy and schooling are

TABLE 1

AGRICULTURAL PRODUCTIVITY IN INDIAN STATES

(At Current Prices)

		Productivity per Worker (Rs.)			*Productivity per Hectare of Land (Rs.)*		
		1960-61	*1970-71*	*gr*	*1960-61*	*1970-71*	*gr*
1.	Andhra Pradesh	437.6	806.3	7.66	433.1	900 1	9.80
2.	Assam	771.7	1307 7	6.31	923.6	1866 0	9 28
3.	Bihar	395.5	682.0	6.59	598.1	1195.5	9.08
4.	Gujarat	675.5	1634.3	12.90	315.1	955.5	18.48
5.	Haryana	1001.8	2483.1	13.44	348.7	1245 3	23.38
6.	Jammu and Kashmir	492.8	1064.3	10.54	551.3	1361.8	13.37
7.	Kerala	997.4	2092.8	9.98	1349.8	3177.7	12.31
8.	Madhya Pradesh	500.6	898.7	7 23	300.3	596.0	8.95
9.	Maharashtra	621.8	886.7	3.88	342.0	581.5	6.37
10.	Karnataka (Mysore)	579 9	1268.7	10.80	315.6	870.8	15.99
11.	Orissa	636 9	1365 2	10.40	461.6	1275.6	16.03
12.	Punjab	930.5	2649 6	16.80	510.7	1605 7	19.49
13.	Rajasthan	564.8	1350.0	12.64	205.8	554 5	15 40
14.	Tamil Nadu	501.3	1038.0	9.73	668 7	1499.0	11.29
15.	Uttar Pradesh	522.1	1057.4	9.32	479.4	1101.8	11.80
16.	West Bengal	755.1	1333.3	6.96	790.7	1716.7	10.65
	All India	562.9	1116 6	8.94	430.0	990.2	11.84

Symbol : gr Average Annual Growth Rate
Source : A. G. Majumdar (1973)

rarely needed by agriculturalists in rural areas, is determined by two important factors, viz. productivity of land and the density of population in rural areas Productivity of land in turn is a function of the size of the operational holdings and a bunch of factors such as fertilizers, manures, seeds, irrigation, rainfall, area of land under cultivation, total human and animal labour, etc. Thus, agricultural productivity is viewed as a function of a bunch of physical inputs.

But the 'traditional factors' do not explain agricultural productitity in full. For example, in Japan, the net real output in agriculture increased by 150 per cent between 1880 and 1938. But the traditional inputs rose by about 30 per cent only. In other words, the traditional inputs increased by 0.5 per cent per annum, while the output increased by 2 per cent (Tang 1963). The residual can be explained by considering the human capital, particularly the literacy and educational levels of the workers. Of late, the importance of this modern factor in explaining agricultural productivity has been clearly recognized. Agricultural economists all over the world have been aware of the contribution of this non-conventional input to the productivity in agriculture per hectare as well as per worker.

Horvat (1958) observes that the low level of schooling of farm people becomes a limiting factor in the rate of agricultural development, as the poor countries enter substantially upon the process of modernizing agriculture.

"Education is another bottleneck in agricultural development. Virtually all aspects of agricultural development hinge on creation of broad range of educational institutions... In agriculture trained manpower breaks the bottleneck to efficient utilisation of the labour and land resources that are already abundant in agriculture" (Mellor 1967).

Griliches through his continuous research (1958, 1964, 1970) asserted that education does enter the production function and it is "both significant and important as a source of aggregate growth output" (1964).

Wharton (1965) rightly pointed out that "the fundamental problem of agricultural growth is an educational problem"; particularly before the take-off stage of the economy, education does play a significant role.

Chaudhri (1968) gave an empirical evidence from India fitting a production function that education is having a significant impact on agricultural productivity. He also found that the level of education also influences the use of new inputs like chemical fertilizers and machines in agriculture.

Harker (1973) also made a similar attempt with the Japanese data, and found that "in so far as schooling contributes to the development of general communication skills, including an awareness of the modern sector of society, it can make an important contribution to agricultural modernisation".

Hayami and Ruttan (1971) using international data found that schooling and technical education are having significant effects in explaining inter-country productivity differences in agriculture.

Welch (1970) studying the problem with the US data concluded that education influences allocative ability, and this "allocative ability plays a key role in determining education's productivity in agriculture and is most relevant in a dynamic setting." He also found that there is a significant positive relation between the years of schooling and incomes of the farm labour force in US both for Whites and Non-Whites (Welch 1967). Watts (1973) in a micro-study of the Embu district in Kenya also found that education forms an important factor in agricultural development.

A few rate of return studies have also been made with respect to agricultural workers. Shoup *et al.* (1959) estimated that the incremental return to primary schooling in Venezuela is 130 per cent per annum, based on the earning differences of illiterate agricultural workers and of those who had completed primary education of six years. Gisser (1965) also estimated the rate of return to education in agriculture and it is more than 20 per cent in any region in the US. He finds that schooling in rural farm areas has two effects : (i) the 'out-migration effect' reducing the supply of human agents, and (ii) the 'capability effect' increasing the productivity of labour; and the net effect of more schooling would be to increase income in rural farm areas in addition to encouraging more farm out-migration. An increase in the level of schooling in rural areas by 10 per cent induces a 6-7 per cent additional migration out of agriculture, and the net effect is a raise in agricultural productivity, resulting in a rise in the farm wage rate by 5 per cent.

The main problem in agriculture in developing economies in general and in India in particular lies in the traditional and orthodox thinking and outlook of the people, in the lack of their responsiveness to modern techniques of production, and in their obsolete way of life. The people in rural areas rely primarily upon the muscle power of the human and the animals. They seldom think how fertilizers increase agricultural yield, why small holdings are uneconomic for mechanization, and why over-optimal combination of inputs yields decreasing returns They hardly make an attempt to know about technical development in agricultural production, and even if they know new methods, they seldom afford the risks of attempting them. People who are bound by traditional agriculture cannot increase production on their land, no matter how fertile the land may be. "Thrift and work are not enough to overcome the niggardliness of this type of agriculture" (Schultz 1964). Basically, people in poor countries are reluctant to abandon the age-old techniques and latch into the gadgets of progress, such as high-yielding seeds, more productive animal breeds, contour farming, steel-bleam ploughs, pesticides, chemical fertilizers, sanitary wells and like. They are reluctant as Brewster (1967) pointed out, to concert "their individual behaviours into a national and international network of increasingly large scale specialized units of collective action which are necessary for development and widespread use of increasingly productive technologies."

Thus in the growing economies the fundamental requirement for agricultural development is a change in the attitudes and activities of individuals. So effective literacy and education form the main solution to the various rural problems in general, and to the problem of low agricultural productivity in particular. Education, as Adam Smith (1776) clearly stated, "Stimulates his mental activity; it fosters in him a habit of wise inquisitiveness; it makes him more intelligent, more ready, more trustworthy in his ordinary work, it raises the time of his life in working hours and out-of-working hours". More important it generates capacity for thinking in the people and inculcates in them willingness to put in maximum amount of conscientious work, and willingness to take risks. It can help him, as Montgomery (1967) observed, "understand why change is necessary and can prepare them for making the decisions required in achieving change". Thus education can attack the basic thinking and the primitive attitudes of the people and can bring out in them revolutionary thinking

It may be worthwhile to quote a few lines from Wharton (1965) who points out the effectiveness of education in agricultural development :

> Education pushes back cultural limits or prohibitions it widens the scope for decision-making, becasue it broadens the individual's notions of the 'possible' ; it adds and stimulates motivation; it very often induces frustration which usually leads to heightened personal and political activity with important economic consequences; it enables the individual to engage in the general process of improved rationality or thinking through the problems which he faces and not merely accepting them as unchangeable givens .. . Education increases the farmers' inquisitiveness, which heightens the likelihood of self-discovery of new knowledge concerning the operation of his own farm with its unique bundle of resources.

General education effects agricultural growth by "changing values, attitudes and decision-making."

John Vaizey (1962) while listing three important roles education has to play, points out that education teaches the cultivators simple and elementary rural skills, which will generate small surplus over subsistence consumption and which is fundamental basis for physical capital accumulation.

Education of the people in rural areas promote agricultural development Agricultural development leads to economic growth and economic growth is essential for socio-political progress Thus in the developing countries "there can be no major social progress without economic development, no economic growth without agricultural progress, and no agricultural progress without well-taught farmers" (Chatelain 1963).

Education forms an important variable in agricultural growth not only in poor and traditional societies but also in modernized sectors. The degree of impact, however, differs.[2] The immediate effect is providing the farmer with infra-structure skills which improve the transmission of further knowledge, and which are useful directly in production in making simple arithmetic calculations, keeping records and in determining optimum combinations, etc.

Chaudhri (1971) lists out neatly the various economic effects of education on agricultural development[3]

1. *Innovative Effect*
   (a) Ability to decode new information, know what, why, where, and how,
   (b) ability to evaluate costs and benefits of alternatives,
   (c) ability to establish the quickest access to newly available economically useful information.
2. *Allocative Effect*
   (a) Production activity : ability to choose optimum combinations of crops, and agricultural practices in least number of trials,
   (b) business activity · ability to choose optimum time for marketing, transportation, etc.
3. *Worker Effect*

   Ability to perform agricultural operations more effectively in economic sense, i.e. ability to produce more from a given level of inputs.

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[2] See Schultz (1974) for an analysis of education's impact on agricultural economies of four different types · (i) traditional, (ii) modernizing but poor, (iii) rich and continuing to modernize and (iv) rich with the modernization of agriculture completed.

[3] See also Welch (1970) and Harker (1973)

4. *Externality*

   Neighbouring farmers and other producers of the vicinity who are in direct contact with educated farmers would be able to consult the educated farmers without paying any price for it and being able to copy his source of information crop and input combinations and related production and business techniques of proven success.

Thus the role of education is clearly recognized and is accepted as an important variable in explaining agricultural productivity.

III

In this section the impact of literacy and education on agricultural productivity per hectare of land as well as per worker in India is estimated using the cross-section data on various states in India. A few words may

TABLE 2

LITERACY AND EDUCATIONAL DEVELOPMENT IN RURAL INDIA

State	*Variables*							
	X_1		X_2		X_3		X_4	
Andhra Pradesh	19.19	(11)	103	(10)	329	(11)	7.23	(12)
Assam	25.80	(6)	135	(6)	406	(5)	11.15	(6)
Bihar	17.17	(13)	96	(11)	271	(15)	4.71	(16)
Gujarat	28.33	(4)	138	(5)	375	(6)	11.12	(7)
Haryana	21.72	(10)	124	(8)	352	(8)	10.08	(8)
Jammu and Kashmir	14.11	(15)	93	(12)	338	(10)	6.60	(14)
Kerala	59.28	(1)	221	(1)	689	(1)	21.16	(1)
Madhya Pradesh	16.81	(14)	82	(14)	292	(13)	7.99	(10)
Maharashtra	30.63	(3)	190	(2)	442	(3)	13.88	(3)
Karnataka	25.13	(8)	119	(9)	351	(9)	7.14	(13)
Orissa	24.09	(9)	92	(13)	360	(7)	8.79	(9)
Punjab	27.81	(5)	133	(7)	406	(5)	15.05	(2)
Rajasthan	13.85	(16)	74	(15)	276	(14)	7.70	(11)
Tamil Nadu	32.13	(2)	151	(3)	500	(2)	13.56	(4)
Uttar Pradesh	18.13	(12)	139	(4)	316	(12)	5.08	(15)
West Bengal	25.72	(7)	139	(4)	436	(4)	11.21	(5)

Note : Figures in parentheses are rank orderings.

Sources : X_1 *Census of India 1971*, Vol. I, Part II-a (ii) Union Primary Census Abstract p. XXIV, X_2, X_3 and X_4 Computed from *Education in India, 1969-70.*

be said about the variables we have considered Data regarding number of litrates among agricultural workers or about their educational levels are not readily available. So we have considered the rate of literacy among the rural population which can be expected to have high correlation with the rate of literacy among agricultural workers. Similarly educational development in rural areas is considered as a proxy for the educational levels of the agricultural workers.[4] Again, while speaking about the educational development, the problem of choosing the indicators arise. We have considered three indicators of educational development

1. Number of pupils in all kinds of educational institutions in rural areas per one thousand rural population.
2. Number of teachers in all kinds of educational institutions in rural areas per one lakh rural population
3. Public investment in education in rural areas per capita.

Notation

Y_k Productivity of land, i.e. net output (in rupees) per hectare of net area sown (1970-71).

Y_l Productivity of labour, i.e. net value of agricultural output (in rupees) per worker[5] (1970-71)

X_1 Percentage rate of literacy in rural areas (inclusive of the population in the age-group 0-4) (1971)

X_2 Number of pupils (in all kinds of educational institutions in rural areas) per one thousand population (1969-70).

X_3 Number of teachers (in all kinds of educational institutions in rural areas) per one lakh rural population (1969-70).

X_4 Public investment in education in rural areas per capita (in rupees) (1969-70).

Data on these variables (X_1 to X_4) are given in Table 2, while on the other two variables are already given in Table 1. Variables X_2 to X_4

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[4] The educational development in rural areas in a period may not, however, at all reflect the educational levels of the agricultural workers of the same period. But the educational development (indicated by the number of pupils, and teachers, etc.) leaves indirect impact on agricultural productivity both of land and labour Pupils, teachers, etc. in rural areas who are often consulted by the farm people influence the attitudes and habits of the actual agricultural workers Thus even though the agricultural workers are not formally educated this kind of non-formal education is quite significant and serves the purpose almost to the same extent.

[5] Worker is defined as either cultivator or agricultural labourer.

relate, however, to the reference period 1969-70, while variable X_1 to 1971, and Y_k and Y_l refer 1970-71. Due to unavailability of data on all the variables for a single reference period, we cannot but use them like that. The coefficient of correlations between these variables are presented in Table 3

TABLE 3

CORRELATION MATRIX

	Y_k	Y_l	X_1	X_2	X_3	X_4
Y_k	1.000	.457	770	.605	.808	.681
Y_l		1 000	.413	.297	.373	.563
X_1			1.000	872	959	.902
X_2				1.000	.875	809
X_3					1.000	917
X_4						1.000

Simple linear regression equation of the following type has been used·

$Y = a + b\,X$,
where Y is the explained variable
X is the explanatory variable, and
a and b are constant to be estimated.

A significant coefficient of correlation is found between each of the indicators of educational development and agricultural productivity of land.

TABLE 4

REGRESSION RESULTS WITH EQUATION $Y_K=a+b\,X$

Independent Variable	*Intercept Term*	*Regression Coefficient*	R^2	*F-Value*
X_1	129.714 (0.4695)	46 082** (4.5177)	0.5931	20 410
X_2	11.177 (0 0230)	10.017** (2.8400)	0 3655	8.066
X_3	−659 769+ (1.6867)	5.059** (5.1274)	0.6525	26.290
X_4	234 126 (0 7209)	103.155** (3 4807)	0.4639	12.115

Note · Degrees of freedom : 14 in all cases
**Significant at 1% level
*Significant at 5% level.
+Significant at 10% level.
Single-tail t-test is used for testing significance
Figures in parentheses are t-values.

The coefficient is 0.605 with the variables X_2, 0.808 with X_3, and 0.681 with X_4. X_1 is having a coefficient as high as 0.77. In Table 4 all the regression equations are good fits. Efficiency of public investment is the highest and next comes the impact of literacy rate.

Similarly as can be seen in Table 5 per capita public investment in education influences the labour productivity also at a significant level. Next comes rates of literacy. However X_2 is not statistically significant. Thus both agricultural productivity per hectare of land and per labour are highly influenced by the rate of literacy and educational development in rural areas

But the simple linear regression of equations of the above type may not be economically meaningful. The assumption of constant marginal productivity in these equations, particularly in the context of agricultural productivity is often questioned. Objections also arise against the above model on statistical grounds that when agricultural productivity is the dependent variable, the assumption of homoscedasticity of the regression disturbances is perhaps unrealistic.

TABLE 5

REGRESSION RESULTS WITH EQUATION $Y_l = a + b\ X$

Independent Variable	*Intercept*	*Regression Coefficient*	*R^2*	*F-Value*
X_1	815.217*	22 192^{+}	1704	2.876
	(2.3003)	(1.6960)		
X_2	808.353^{+}	4 428	.0885	1.359
	(1.6088)	(1.1659)		
X_3	564.044	2 100^{+}	.1393	2.266
	(1.0198)	(1.5053)		
X_4	592.734*	76.543*	.3165	6 482
	(1.7992)	(2.5459)		

Note : See under Table 4.

So we choose the Cobb-Douglas type with constant elasticity of the following form :

$$Y = a\ X^b$$

Taking logarithms on both sides, we get,

$$\text{Log } Y = \text{Log } a + b \text{ Log } X$$

Apart from having the property of constant elasticity instead of constant marginal productivity, and not having the homoscedasticity property in a rigid manner, the second model, which is called the Double-Log model or the Cobb-Douglas model is having another property that the influence of extreme observations is small.[6] The results obtained using the Double-Log model are presented in Tables 6 and 7.

TABLE 6

REGRESSION RESULTS WITH EQUATION LOG Y_k=LOG a+b LOG X

Independent Variable	*Intercept*	*Regression Coefficient*	*R^2*	*F-Value*
X_1	2.028**	0.756**	.3460	7.406
	(5.3040)	(2.7214)		
X_2	1.389*	0.803*	.2589	4.892
	(1.8320)	(2.2118)		
X_3	−0.333	1.321**	.4516	11.530
	(0 3331)	(3.3956)		
X_4	2.561**	0.516*	.2005	3.511
	(9.4169)	(1.8736)		

Note : See under Table 4.

TABLE 7

REGRESSION RESULTS WITH EQUATION LOG Y_l=LOG a+b LOG X

Independent Variable	*Intercept*	*Regression Coefficient*	*R^2*	*F-Value*
X_1	2.453**	0.476*	.1976	3 447
	(6.9507)	(1 8567)		
X_2	2.235**	0.417	.1006	1.565
	(3.2121)	(1.2511)		
X_3	1.311	0.697*	.1814	3.102
	(1.2868)	(1.7613)		
X_4	2.548**	0.572**	3546	7.693
	(2.5719)	(2.7731)		

Note : See under Table 4.

Variable X_3 is found to be a significant variable in explaining the productivity differences in the land with the coefficient of correlation as high as 0.672. However, all the non-traditional variables we have considered are having significant impact on productivity of land.

In explaining the differences in agricultural productivity per worker all the variables turned to be statistically significant except X_2, regression coefficient of which is having no doubt the expected sign. Public investment in education and the rate of literacy are, however, having greater influence on labour productivity.

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[6] See Klien (1965) and Houthakkar (1957) for further details

Thus we find that literacy and education do enter into the agricultural production function and they are not less significant variables than the traditional factors. Now we shall examine the importance given to education in rural India in the succeeding section.

IV

This section is devoted to an examination of the importance given to and the problems involved in the growth of education in rural India.[7]

The percentage of literates to total population in rural areas has increased from 19.1 in 1951 to 29.1 by 1961, and to 33.1 by 1971 among males. But literacy among females is very low The rate of literacy among rural women was 12 9 per cent in 1971, while it was only just 8 5 in 1961, and was as low as 5 per cent in 1951. In general, the literacy in rural areas is very much less than that in urban areas; and in rural areas literacy among women is deplorably low

Column 1 in Table 2 brings out the regional imbalances in the development of literacy level in rural areas in 1971. While in states such as Kerala, Tamil Nadu and Maharashtra the level of literacy is relatively very high, states like Madhya Pradesh, Jammu and Kashmir and Rajasthan are at the lowest ladder. It is not difficult to account for these differences.[8]

Educational development in rural India during the 20 years since the inception of planning is summarized in Table 8. The number of students in rural areas increased from 18 million in 1950-51 to 56 million by 1969-70 at an average annual growth rate of 10 4 per cent. The development at secondary level is very high, while the growth of enrolments at primary level is very low. It rose from 14.5 million to 32 million in 20 years. But the enrolments at higher level are more than trebled, and those at the secondary level increased more than six times during the same period. Similarly, the number of educational institutions at higher level increased by about 30 times at an average annual growth rate of 152 per cent, and the secondary schools by seven times at the rate of 31 per cent, while the number of primary schools was just doubled during the period from 1950-51 to 1969-70.

The growth retes reveal the imbalances clearly. Such a high imbalance may not be good. There should be balanced development of all the

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[7] See Tilak (1975) for a brief note on educational development in rural India as against in urban India.

[8] For an analysis on regional imbalances in the levels of literacy in India, see Tilak (1977b)

TABLE 8

EDUCATIONAL DEVELOPMENT IN RURAL INDIA

Year	*Higher**	*Secondary+*	*Primary++*	*Vocational (School)*	*Total*
A. Number of Institutions					
1950-51	58	13240	176027	16539	205864
1955-56	87	21589	247823	40897	310896
1960-61	270	49464	301518	57776	410028
1965-66	1402	79001	357457	205429	643289
1969-70	1816	95719	369120	192512	659071
B. Number of Pupils (in thousands)					
1950-51	104	3544	14490	1090	18227
1955-56	242	3625	17535	1279	23680
1960-61	362	10827	21656	1496	34339
1964-65	199	16056	28941	1695	46941
1969-70	392	21356	32384	2070	56203
C. Expenditure on Rural Education (Rupees in millions)					
1955-56 (T)	23.06	220.24	401.26	29 79	674 35
1960-61 (T)	45 69	512.46	550.26	39.53	1147.94
1965-66 (D)	180 46	1099.42	941.92	58.93	2280.73
1969-70 (D)	176 59	2092.70	1542.33	30.10	3841 72
Average Annual Growth Rate (Institutions)	151.55	31.15	5.48	53 20	11 01
Average Annual Growth Rate (Pupils)	13 85	25.13	6.17	4 50	10.42

Note : *includes both universities and colleges

+includes also middle level

++includes also pre-primary level

Source · *Education in India,* Vol. 1 (different volumes)

Symbols : T Total expenditure on education

D Direct expenditure on education

levels of education. Particularly the very low rate of growth of primary level relative to other levels deserves serious attention.

Not only there is imbalance in the development of various levels of education in the country as a whole, there are also disparities in educational development between rural areas and urban areas. The development of education in rural areas as against that in urban areas is very satisfactory in case of states like Maharashtra, Kerala, and Tamil Nadu, while there is large inequality between the educational development in rural areas and that in urban areas in Rajasthan, Madhya Pradesh and Karnataka.[9] Thus educational development in rural India is even though satisfactory in quantitative terms, still there are several unsolved problems.

One of the alarming problems is wastage due to drop-out and stagnation in school level education in rural areas. The Agricultural Economics Reserch Centre (1968) of the Delhi University focussed on the problem of wastage in primary schools and also made an important observation that a major part of the normal school-year and particularly the time of examinations are synonymous with the agricultural season and in particular with the harvesting season; and this forms in important factor for the glaring drop-outs and stagnation in rural areas, since in the agricultural season the opportunity cost of the pupils is very high, and the people in rural areas are not ready to bear scuh a huge cost. So it is argued in the report to change the school-year in such a way that it does not come into clash with the agricultural season. If such a change is not possible for some reason or other, non-formal education may be given much emphasis, since out-of-school education offers an easy way-out to the problem of time.

However, several problems with respect to poor educational levels and achievements in rural areas find their origin in the basic issue of economic poverty. So measures in the direction of raising economic standard of the rural people should be taken, complemented with free education, free supply of books, free mid-day meal programmes, etc.

Another problem that has been often raised is with regard to the relevance of curriculum. People in rural areas find the school curriculum irrelevant to their needs. Accordingly, most people look at their children as escaping from the hardships of rural life, because they find no relevance in their education to the rural life. Then the suggestion that comes from the 'ivory tower' is to open new schools in rural areas, where agriculture and other aspects of rural life from an important part of the curriculum. But this again is ought to fail as the experience of some African countries, e.g. Tanzania, Ghana, Nigeria, Jordan, etc. reveals. This is due to one main reason: few parents in rural areas wish their children to be in agriculture They want white-collar jobs for their children, and when their children, having received new rural-oriented education, find no place in the competitive job-market for white-collar jobs, they feel that their education is wasted; expenditures on their education yielded no benefits, and they are discriminated against.[10] However, there is a large scope for reforming the curriculum towards productivity-orientation without much radical reforms.

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[9] See Tilak (1977c) for further details.

Coombs and Ahmed (1974) strongly suggested non-formal education as "an indispensable and potent instrument of rural development". There is no doubt, a large number of problems facing the policy-makers with respect to rural education. But there is also an equally large number of solutions to the problems suggested by eminent educationists. There is no need for repeating them.

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[10] See also Naik (1977).

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Scaling of Some Significant Innovations in Examination System

Views of University Teachers and Students

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This study makes an investigation into the views of university teachers and students separately, regarding the relative scale positions of significant innovations in Indian examination system at the university and college levels. Thirteen innovations were arranged in different pair combinations in the form of a check-list. The check-list blanks were administered to the groups of 80 university teachers and 250 students. Thurstone's Pair Comparison Method was applied separately to the responses of the groups of teachers and students to determine the relative scale positions of the innovations.

EFFECTIVE EVALUATION of student achievement with respect to accepted goals of instruction is considered an indispensable aspect of good teaching. The evaluation procedures that are used become a part of the instructional process and influence students in many ways. Aspects of this influence have been studied to some extent. One of the functions that evaluation serves is to enable students to determine how well they are achieving (Harris 1960, p. 857). Evidence indicates that when students are aware of their learning progress, their performances will be superior to what it would have been without such knowledge (Forlano 1936). Written examinations or tests have commonly been

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*This paper is based on data collected in connection with the project, "A study of some significant innovations in examination system at different levels of instruction in Himachal Pradesh," conducted under a grant from the Himachal Pradesh University, and forms a part of the project. The investigator expresses his gratitude to the university for providing grant and facilities for this study.

used as the chief evaluation device and are often considered the sole criterion for judging a man's competence for various activities. But their limitations have been demonstrated by several studies in India and abroad (Vallance 1947, Cowles and Hubbard 1952, McKeachie 1955, Diederich 1957, Harper 1963, 1965, Taylor 1963, Taylor *et al.*, 1966, Harper and Misra 1967, Misra 1968, 1972, Koul 1974, 1974c). The beneful effects of the examination system on education in general, and secondary education in particular, have also been discussed in the reports of several seminars, committees and commissions. Nevertheless, the importance of the system has been accepted by all. The Radha Krishnan *Commission and other subsequent Commissions* have *suggested merely* the improvement of the examination system but not its total abolition. At a seminar on examinations in higher education organized by the Inter-University Board of India and Ceylon in January 1971 at New Delhi, it was felt that there is need to improve upon the existing system and streamline it by ensuring greater reliability as well as greater objectivity The crucial question, therefore, is not of the abolition of the system but making it a step in the process of teaching and learning. It is from this point of view that a number of reforms in the form of innovations have been suggested by verious academic and research organizations like the University Grants Commission (UGC), the National Council of Educational Research and Training (NCERT), the Central and State Boards of Secondary Education. The UGC has so far held three zonal workshops. The main recommendations made by these workshops relate to the introduction of semester system, internal assessment and grade system; setting of question papers and conducting of examinations. Recently, the Central and some State Boards of Secondary Education in callaboration with the NCERT have also decided to introduce a number of innovations in the examination system at the high and higher secondary school levels.

An innovation once introduced has chances of success or failure depending upon a number of factors. It is rarely that an innovation succeeds in exactly the way in which it is originally conceived. It may, however, succeed appreciably in terms of its objectives. An innovation may not succeed and may have to be given up. Yet again an innovation may succeed in some form after being restructured, modified, accepted and institutionalized. The needs and circumstances differ from institution to institution. What is possible in one may not be possible in another. Sometimes it is argued that each educational institution should decide for itself the pattern and type of innovations to be adopted in improving its examination system keeping in view the student enrolment, level of instruction, nature of courses and local needs. It is often thought that an innovation can neither be effective nor successful if it is introduced without its concomitant parts.

The Present Study

Though there is no unanimity about the number and the specific nature of innovations to be adopted by a university or a school board, yet there is some consensus about the main and broad innovations that are essential for bringing some significant improvement in the examination system. But again there is a lot of difference of opinion about the relative importance of these innovations. Hence, it was thought worthwhile to make an investigation into the views of university teachers and students separately, regarding the relative scale positions of significant innovations, and then to compare the two scalings.

Plan of the Investigation

Sampling

Two samples of 250 postgraduate students and 80 teachers were selected randomly from the various faculties of Postgraduate Centre and Directorate of Correspondence Courses of Himachal Pradesh University, Simla.

Tool

The investigator first of all culled some significant innovations in examination system which are being introduced at the university level and put them in 13 clear-cut statement mentioned in Table 1.

TABLE 1

INNOVATIONS CHOSEN FOR SCALING

A Introducing the Grade System of Ranking
B Scope for Re-evaluation of Answer-books
C Orientation of Paper-Setters and Evaluators
D Open-book Examination System
E Using Computers and Mechanical Devices in Preparing Award-rolls and Compiling the Results
F Making Evaluation Instructions Precise and Clear
G Introducing the Semester-System of Examination
H Spot-evaluation of Answer-books
I Supplementing Written Examinations with Oral Tests
J Supplementing External Examinations with Periodical Internal Assessment
K Making Examinations Completely Internal
L Defining the Scope of Questions in Simple and Clear Language for Making the Task of the Examinees Well-defined and Pinpointed
M Supplementing Essay-type Examinations with Objective-type Tests

Then each of these statements were combined in pairs with every other statement and thus 78 pairs of statements were formed. The pairs were arranged and enlisted in such a manner that every statement in the 12 pairs in which it appeared, occupied the first and the second positions of equal number of times and the pairs in which it appeared were kept as far apart in the list as possible. The pairs thus arranged were got printed in the form of a 'check-list'.

Procedure and Results

The check-list blanks were issued to the selected groups of teachers and students and they were asked to respond according to the following instructions, printed on the title page of the list ·

> In the light of the recommendations of the various committees and commissions on examination reforms, some significant measures in the form of innovations are being taken at the university level. These innovations are arranged in the following different pair combinations. You are requested to consider each pair carefully and put a tick mark (√) before the innovation you think to be more important and desirable of the two in the pair.

Thurstone's Pair Comparison Method—Case V (Guilford 1954) was applied separately to the responses of the groups of university teachers and students to determine the relative scale positions of the innovations. For this proportion matrices were prepared from the response sheets of two groups separately and are presented in Tables 2 and 3.

The innovations were arranged in matrices not in their serial order but in the increasing order of the sum of their columns. This sort of rank order does not tell the psychological distance between the different innovations on an equal unit preferential scale Thus the proportions in the matrices were converted into 'standard deviates' with the help of Normal Distribution Table Proportion more than .500 were given a positive value, and those below 500 a negative sign.

The 'standard deviates' of the columns were summed up and averaged to get the scale positions of the innovations In order to get rid of the negative signs, a zero value has been given to the innovation of lowest value by adding to each mean a positive number equal to the absolute value of the mean of the innovation with the lowest scale value

The test of internal consistency to justify the application of Case V

TABLE 2

PROPORTION MATRIX OF TEACHERS

INNOVATION	*K*	*D*	*H*	*E*	*B*	*F*	*C*	*L*	*I*	*J*	*A*	*G*	*M*
K	(500)	.700	.700	.725	.625	.800	.875	.875	.975	.750	.850	.725	.900
D	.300	(.500)	.700	.625	.625	.750	.625	.775	.825	.725	.875	700	.825
H	.300	.300	(.500)	.600	.650	.750	.550	.725	.750	.869	.750	.750	.750
E	.275	.375	.400	(.500)	.550	.625	.650	.825	.750	.675	.875	.875	.750
B	.375	.375	.350	.450	(.500)	600	.800	.750	.675	.525	.750	.825	.775
F	.200	.250	.250	.375	.400	(.500)	.575	.675	.700	.525	.600	.775	.700
C	.125	.375	.450	.350	.200	.425	(.500)	.550	.525	.625	.500	.650	.700
L	.125	.225	.275	175	.250	.325	.450	(.500)	.625	.700	.650	.475	.625
I	.025	.175	.250	.250	.325	.300	475	.375	(.500)	.700	.500	.600	.675
J	.250	275	.131	.325	.475	.475	.375	.300	.300	(.500)	.350	.550	.575
A	.150	.125	.250	.125	.250	.400	.500	.350	.500	.650	(.500)	.475	.650
G	.275	.300	250	.125	.175	.225	.350	.525	.400	.450	.525	(.500)	375
M	.100	.175	.250	.250	.225	.300	.300	.375	.325	.525	.350	.625	(.500)
SUM	2.500	3 650	4.350	4.375	4.750	5.975	6 525	7.100	7.350	7.525	7.575	8.025	8.300

TABLE 3

PROPORTION MATRIX OF STUDENTS

INNOVATION	*K*	*D*	*H*	*B*	*E*	*I*	*C*	*F*	*J*	*A*	*L*	*M*	*G*
K	(500)	.560	776	734	.832	.846	.812	.854	.832	.784	.930	.902	.888
D	440	(500)	.706	.622	.678	.748	.678	.664	.762	.784	.762	.748	.888
H	.224	.294	(.500)	.476	700	.602	700	.658	.776	.812	.734	.790	.762
B	266	378	.524	(.500)	.654	.538	.742	.706	.686	.770	.720	.622	.888
E	.168	.322	.300	.346	(.500)	.454	.532	.608	.622	.686	.804	.868	.902
I	.154	.252	.398	.462	546	(500)	504	.594	.636	.602	.706	720	.860
C	.188	.322	.300	258	468	.496	(.500)	.622	.608	.672	.692	.622	.580
F	146	.336	.342	.294	.392	406	.378	(.500)	.608	.588	566	.622	.854
J	.168	238	.224	.314	.378	.364	392	.392	(.500)	.532	.566	.608	.734
A	216	.216	188	.230	.314	.398	.328	.412	.468	(500)	.510	.454	.588
L	.070	238	266	.280	.196	.294	.308	.434	.434	.490	(.500)	.500	.692
M	.098	252	.210	.378	.132	.280	.378	.378	.392	.546	.500	(.500)	544
G	.112	112	.238	.112	.098	.140	.420	.146	266	412	.308	456	(.500)
SUM	2 250	3.520	4 472	4.506	5.388	5 566	6 172	6 468	7 090	7.678	7.798	7.912	9.180

assumption ($Z_{jk} = R_j - R_k$) was applied using the formula :

$$t=\sqrt{2}\times x^2-\sqrt{2n}-1$$

in which n is the degrees of freedom and x^2 is given by the expression $\frac{N}{821}\Sigma(\theta-\theta')^2$. The 'Theta-Angle Difference' table was used to calculate the value of this expression. The t-values came out to be 1.49 and 1.61, respectively, much less than 1.96 and so the assumption of Case V for the construction of the present scale stands justified.

The means and the positive scales values of the innovations with their symbols are presented in Tables 4 and 5 for the two groups of teachers and students respectively.

Discussion

A comparison of the two scales shows that there is a good deal of similarity in scale positions of the innovations according to the views of the university teachers and students. This similarity becomes all the more evident if we keep in mind the fact the positions of the innovations are only approximate, since the computed values have margins of error because of the sampling chance, and we can, therefore, rely more on the broad positions of the constellations of innovations in the different parts of the scales than on the minute differences in the numerical values of the innovations.

It is to be noted that the innovations, 'introducing the grade-system of ranking', 'supplementing essay-type examination', with 'objective-type tests', 'introducing semester system of examination' and 'supplementing external examinations with periodical internal assessment', are in the top region of both the scales. The study thus reveals that though the individuals among university teachers and students may differ in their views about the relative importance of innovations in examination system, yet the collective opinion of both the groups is in favour of replacing the present numerical-system of marking and annual system of examination with grade-system of marking and semester system of examination, respectively ; supplementing the existing external essay-type examinations with objective-type tests and periodical internal assessment.

In the system of external examinations at the end of the school, college or university stage, there is unavoidable subjective element due to the continuance of purely essay-type test items in the question papers. One of the greatest disadvantages, as pointed out by the Secondary Education Commission (1953, p. 120) also, is that essay-type examination

TABLE 4

SCALE POSITIONS OF THE INNOVATIONS ACCORDING TO TEACHERS

INNOVATIONS	*K*	*D*	*H*	*E*	*B*	*F*	*C*	*L*	*I*	*J*	*A*	*G*	*M*
K	(0.000)	0.524	0.524	0.598	0.319	0.842	1.150	1.150	1.960	0.675	1.036	0.598	1.282
D	—0.524	(0.000)	0.524	0.319	0.319	0.675	0.319	0.755	0.935	0.598	1.150	0.524	0.935
H	—0.524	—0.524	(0.000)	0.253	0.385	0.675	0.126	0.598	0.675	1.122	0.675	0.675	0.675
E	—0.598	—0.319	—0.253	(0.000)	0.126	0.319	0.385	0.935	0.675	0.454	1.150	1.150	0.675
B	—0.319	—0.319	—0.385	—0.126	(0.000)	0.253	0.842	0.675	0.454	0.063	0.675	0.935	0.755
F	—0.842	—0.675	—0.675	—0.319	—0.253	(0.000)	0.189	0.454	0.524	0.063	0.253	0.755	0.524
C	—1.150	—0.319	—0.126	—0.385	—0.842	—0.189	(0.000)	0.126	0.063	0.319	0.000	0.385	0.524
L	—1.150	—0.755	—0.598	—0.935	—0.675	—0.454	—0.126	(0.000)	0.319	0.524	0.385	—0.063	0.319
I	—1.960	—0.935	—0.675	—0.675	—0.454	—0.524	—0.063	—0.319	(0.000)	0.524	0.000	0.253	0.454
J	—0.675	—0.598	—1.122	—0.454	—0.063	—0.063	—0.319	—0.524	—0.524	(0.000)	—0.385	0.126	0.189
A	—1.036	—1.150	—0.675	—1.150	—0.675	—0.253	0.000	—0.385	0.000	0.385	(0.000)	—0.063	0.385
G	—0.598	—0.524	—0.675	—1.150	—0.935	—0.755	—0.385	0.063	—0.253	—0.126	0.063	(0.000)	—0.319
M	—1.282	—0.935	—0.675	—0.675	—0.755	—0.524	—0.524	—0.319	—0.454	—0.189	—0.385	0.319	(0.000)
SUM	—10.658	—6.529	—4.811	—4.699	—3.503	0.002	1.534	3.083	4.374	4.412	4.617	5.593	6.398
MEAN	—0.819	—0.502	—0.371	—0.361	—0.269	0.000	0.118	0.236	0.336	0.339	0.355	0.430	0.492
POSITIVE SCALE	.000	.32	.45	.46	.55	.82	.94	1.06	1.16	1.16	1.17	1.25	1.31

TABLE 5

SCALE POSITIONS OF THE INNOVATIONS ACCORDING TO STUDENTS

INNOVATIONS	*K*	*D*	*H*	*B*	*E*	*I*	*C*	*F*	*J*	*A*	*L*	*M*	*G*
K	(000)	0 151	0.759	0.625	0 962	1.019	0 885	1.054	0 962	0.786	1.476	1.293	1.216
D	—0.151	(.000)	0 542	0 311	0.462	0 668	0 462	0.423	0.713	0.786	0.713	0.668	1 216
H	—0 759	—0.542	(.000)	—0.060	0.524	0.259	0.524	0.407	0.759	0.885	0.625	0.806	0 713
B	—0.625	—0.311	0 060	(.000)	0.396	0.095	0.650	0.542	0.485	0.739	0 583	0 311	1.216
E	—0.962	—0.462	—0.524	—0 396	(.000)	—0.116	0.080	0.274	0 311	0.485	0.856	1.117	1.293
I	—1 019	—0.668	—0.259	—0.095	0.116	(.000)	0.010	0.238	0.348	0.259	0.542	0.583	1.080
C	—0.885	—0.462	—0.524	—0 650	—0.080	—0.010	(.000)	0.311	0.274	0.445	0.502	0.311	0.202
F	—1 054	—0.423	—0.407	—0.542	—0.274	—0.238	—0.311	(.000)	0.274	0.222	0.116	0.311	1.054
J	—0 962	—0.713	—0.759	—0 485	—0 311	—0.348	—0.274	—0.274	(.000)	0.080	0.166	0 274	0.625
A	—0.786	—0.786	—0.885	—0.739	—0 485	—0.259	—0.445	—0 222	—0.080	(.000)	0.025	—0.116	0.222
L	—1.476	—0.713	—0.625	—0.583	—0 856	—0.542	—0.502	—0.166	—0.166	—0.025	(.000)	.000	0.502
M	—1 293	—0.668	—0.806	—0.311	—1.117	—0.583	—0.311	—0 311	—0.274	0.116	.000	(.000)	0.111
G	—1.216	—1.216	—0.713	—1.216	—1 293	—1.080	—0.202	—1.054	—0.625	—0.222	—0.502	—0.111	(.000)
SUM	—11 188	—6.813	—4.141	—4.141	—1.956	—1.135	0.566	1.222	2.981	4 556	5.152	5.447	9.450
MEAN	— 0 861	—0.524	—0.318	—0 318	—0.150	—0.087	0 044	0.094	0.229	0 350	0.396	0.419	0.727
POSITIVE SCALE	0 00	0.34	0.54	0.54	0.71	0.77	0 91	0.96	1 09	1.21	1.26	1.28	1 59

gives undue weight to the power of verbal expression in which so many individual differences exist. But the complete abolition of the essay-type tests is not favoured by various commissions and committees as they have been found to be indispensable instruments for assessing abilities like the application of knowledge, organization and integration of thought and knowledge, and power of expression. Hence, we have to devise some ways and means to improve essay-type tests so that their element of subjectivity can be considerably reduced and they become a valid and reliable measures of educational achievement. In the present study both the groups of university teachers and students are of the opinion that the essay-type tests should be supplemented by the objective-type test items in order to increase their objectivity, reliability and validity. It is remarkable that the researches by Cowles and Hubbard (1952), Singh (1970), Rao (1974), Gayen and others (1962),and Koul (1974 a) have also brought out that in order to reduce the element of subjectivity of the essay-type tests and encourage intelligent understanding among the examinees, objective-type tests of attainment should be widely introduced side by side.

Introducing the semester sytem of examination have also been given top priority by the groups of university teachers and students because of the advantages of the system experienced by them in the Himachal Pradesh University from which the samples for the present study were chosen. The semester signifies the division of the academic year into two parts and it also implies that courses are designed to cover one semester instead of a year, and that final examinations are held twice a year. The major advantage of the semester system would seem to lie in the fact that it allows for much greater flexibility as far as the content of the courses is concerned. A teaching faculty in a college or a university can usually offer a much greater variety of courses under the semester system than when courses are of one to two years' duration. With a large number of courses available, the number of students per course is reduced. Thus the students can be allowed wider choice to fit their own special needs and interests, and more individualized education results. Finaly, the semester offers the possibility of a quantum increase in academic standards. For many students concentrating on fewer courses leads to more efficient study and learning. It is also well known that studends do most of their serious learning in three months before the final examination. If we have two final examinations in a year, and thus put two such three months period into the academic year, instead of one it is obvious that nearly twice as much can be learned. If a one year course is cut into two parts, a much more intensive coverage of each part is possible. The Education Commission (1966, pp. 278-279) has pointed out that the large gap between the standards in our country and those in the advanced countries is widening rapidly, and the first degree in India is little better than the high school level in such countries. A committee of the experts appointed by the UGC for preparing a brochure outlining the principles and mechanics of the semester system has recommended that the effective use of the potentiality of the semester system could go a long way to narrow down the large gap between the standards in our country and those in advanced countries (Singh 1975).

The characteristic features of American semester system are grade system of marking and continuous periodical internal assessment. In the present study, too the innovations 'introducing the grade-system of ranking' and supplementing external examinations with periodical internal assesment', have clustered together in the top region of both the scales But it may be noted that the semester system can work effectively and successfully if it is introduced without its concomitant parts. While discussing the principles and mechanics of the semester system, Singh (1975) has also pointed out that :

> A little reflection should bring the appreciation that it is a case of concomitance and not one of integral relationship. Internal evaluation and award of grades can certainly be introduced in universities with longer courses and widely spaced examinations with the same appropriateness as in those which my adopt the semester or trimester system Likewise examinations can be completely ar partially external with numerical marks as at present even though course units be shorter and examinations more frequent. There is nothing wrong in a wholesale borrowing from any system but the notion that all the components, essential and non-essential, must be together and if they do not, the system will be deprived of much of its usefulness is ill founded. Educational planning demands that all the variables in a particular situation be taken into consideration and the best that may be feasible be done. Between all and none several choices are open (p.14).

It goes without saying that all universities are not ideally suited to try out all that goes with semester system and so each university should decide for itself the pattern of semester system, keeping in view the student enrolment, level of instruction, nature of courses and the unitary or affiliating nature of university. Thus the grade system of ranking can be introduced quite independently in any system of examination because of its relative advantages over the existing numerical system of marking The relative ranking of students in terms of grades like 'outstanding', 'very good', 'poor' ; etc. instead of percentile basis of awards on a 101-point scale may prove to be more exact, objective and scientific. The ranking on a 101-point scale seems to be unrealistic because it is very difficult to discriminate between the finer points on such a scale. Finer distinctions, as Anastasi (1968) has put it, are unrealistic and are likely to add only chance variance to judgments. The ill effects of numerical marking are legion and the system has done incalculable harm to innumerable students

It may be pointed out that both the groups of teachers and students have placed the innovation, 'making examinations completely internal', at the very bottom of their respective scales. This indicates that university teachers as well as students are not in favour of internalizing the examination system completely. There have been cases of partiality and some malpractices in the educational institutions where such an innovation was tried and experimented. The students feel that such a system may create an atomsphere of sycophancy and submissiveness. The teachers think that if the examination system is purely an internal affair, they will be evaluating only their own students and the question of comparison with others will not arise There can be persistent over-assessment of the candidates by the teachers for certain extra-academic considerations such as personal likes and dislikes, caste and community, payment of private tuition or through other forms of subterfuge. The evils of the present purely external examination system at different levels of instruction, which have been discussed in reports of several committees, commissions, are also well known to everybody. Thus, after reviewing the defects of purely external as well as internal examination system, it would be worthwhile to devalue, to some extent, the external public examination by internalizing a part of the final assessment. In the present study it is notable that the groups of university teachers and students have placed the innovation, 'supplementing external examinations with periodical internal assessment' in the top regions of both the scales. Secondary Education Commission (1953, pp. 120-121) and Education Commission (1966, pp. 246-248, 290-291) have also remarked that singly neither the external nor the internal examination can give a correct and complete picture of a student's all round progress at any particular stage of his education and so asystem of internal aseessment based on periodical evaluations, should be introduced as a supplement to external examination. But it has to be noted that the results of these internal assessments should not be mechanically added

to the external marks but kept separate and both should be shown side by side in the final certificate.

The innovation, 'defining the scope of questions in simple and clear language for making the task of the examinees well-defined and pinpointed' is also in the upper regions of both the scales, which indicates that both the groups give equal and quite a good deal of importance to this innovation. Most of the defects in the present essay-type tests are due to shortcomings in the questions and question papers set in the examination. Very few of the paper-setters possess the knowledge and skill necessary for the construction of valid and reliable tests. The study carried out by Gayen and others (1962) has also shown considerable defects in the framing of questions and question papers. The Education Commission (1966, p. 246) is also of the opinion that no major break-through towards improvement of examinations is possible unless the nature of questions asked is improved. On the basis of the results of an investigation (Singh 1970), conducted under the supervision of the author, it may be said that inter-examiner reliability of the essay-type tests can be increased significantly by making the task of examinees and examiners well-defined, which could be made possible by making the language of the question items more specific, precise, pinpointed and understandable to the examinees. Moreover, the general instructions issued to the examinees in the form of 'note', etc. can be modified by instructing the examinees clearly not to write anything less or more than what has been asked in the question.

The only innovation, 'supplementing written examinations with oral tests', which has shifted in the upper region of teachers' scale has come down in the lower region of students' scale. This indicates that the views of university teachers and students differ with regard to the relative importance of this innovation. The students appear to have given a low importance to oral tests as a supplement to written examinations and on the other hand, the teachers have given quite a good deal of importance to this innovation. It seems that the opinion of university teachers is quite in agreement with the recommendation of the Education Commission (1966, p. 243) that there are "several important aspects of the student's growth that cannot be measured by written examinations, and other methods such as observation techniques, oral tests and practical examinations, have to be devised for collecting evidence for the purpose".

Coming down to the middle of the scales, we find that the innovations, 'orientation of paper-setters and evaluators' and 'making evaluation instructions precise and clear', are in the same region of both the scales, which means that university teachers and students give equal importance

to the measures which deal with the training of paper-setters and evaluators, and making evaluation instructions more or less objective. The orientation of paper-setters and evaluators in the form of seminars, workshops, inservice training and discussions is worthwhile to raise their technical competence. It would help the paper-setters to frame questions oriented to testing not nearly the acquisition of knowledge but the ability to apply knowledge and development of problem-solving abilities as pointed out by the Education Commission (1966, p. 246) also.

Consistency in the standard of evaluating and marking the answer-*scripts can be increased by making 'general' and 'special' instructions*, issued to the examiners, precise and clear. In some Boards of Secondary Education, the assistant examiners are called for a conference with the head examiners to decide on the marking scheme before the answer-scripts are evaluated. But in most of the Boards, as pointed out by Rao (1974), the head examiner issues instructions to assistant examiners. These instructions are very sketchy and are invariably received late by the assistant examiners. The Board of High School and Intermediate Education of Uttar Pradesh explicitly asks the examiners to go ahead with evaluation without waiting for the instructions. The exminers are required in this as well as in many other Boards to submit a sample of exmined answer-scripts to the head examiners. The whole procedure is drawn up in such a way as to give maximum freedom to the examiners to evaluate answers in their own ways. The system in the university examinations is even worse than this, as the universities seem to believe that what is being evaluated is some deceptive thing impossible of being put in in any order. In the absence of a definite scheme of evaluation, each examiner goes through some answer-scripts hurriedly, forms his own scheme, and starts giving marks. The candidates whose answer-scripts are evaluated first, must be luckless, individuals for many a time the examiners would be forced to whittle down his evaluation standards as he goes through the whole set of papers allotted to him. The procedure, as remarked by Rao (1974), has the build-in opportunity for large subjectivity and inter-examiner variability The results of the investigations conducted by the Examination Research Unit of the Gauhati University (Misra 1968, Taylor 1963, Taylor, Tluanga and Misra 1966, Misra 1972) are applicable precisely to this situation. Examiners differed in the range of marks they had given, in numbers of answer-scripts awarded, different divisions and the numbers of failures declared by them. It was also found that the distributions of marks awarded by most of the examiners showed what was described as 'J-effect', i.e. a large number of scripts receiving exactly the pass marks.

This may be due to the existence of strong social pressure on the unconscious mind of the examiners regarding failing of students. Another idiosyncrasy noted was the existence of 'persistence-effect'—the evaluation of a paper being effected by the impression the examiner had received from the immediately preceding papers. The Examination Research Unit has come out with the suggestions that the evaluation instructions should be precise and specified, that the answer-scripts be randomized before distribution among the examiners, and that the marks given by each examiner, be scaled to an average level representing the mean of all the examiners concerned.

It is also worthwhile that the examiners may either be asked to go through the whole lot of answer-scripts before their evaluation or they be asked to evaluate all answers to one question before proceeding to the next question. The special instructions can be made more detailed by bifurcating the questions into sub-questions, and specifying the weightage part-wise. For each sub-question, it is quite possible to prepare a brief model answer expected of the students. Some credits may be set apart for non-tangible aspects such as organizational ability, style, existence of critical thinking, etc. in certain subjects.

The four innovations, 'open-book examination system', 'using computers and mechanical devices in preparing award-rolls and compiling the results', 'scope for re-evaluation of answer-books', and 'spot-evaluation of answer-books', are in the lower region of both the scales. This indicates that the groups of university teachers and students do not attach much importance to these innovations. But as most of our teachers and students are unfamiliar with these innovations, it may be the reason that the two groups have placed them so low in the scale.

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Factorial Invariance

A Review of the Literature

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EDUCATIONAL RESEARCHERS who use factor analysis as a tool in their statistical analyses tend to treat their technique as a purely descriptive tool. This tool provides them with the characteristics (factor loadings) of the educational or psychological measurements they have utilized. Even though these educational researchers are considering their factor analysis as a statistical technique, factor theorists have been slow in applying the concepts and techniques of modern statistical inference to it. Factor analysts have a habit of treating these loadings in a purely descriptive manner, loadings greater than .30 are called "significant," those less than .20 are said to be "in the hyperplane"; and those between are treated tentatively, all independently of sample size. Following this same reasoning, if two groups are given the same battery and the tests are found to have different loadings, the interpretation is that the tests measure different traits in the two groups, even if the groups seem to approximate being samples from the same population. The viewpoint that factor analysis is performed solely to determine the loadings of tests on factors which characterize only the unique group of individuals that participated in the study is surely an invalid one. Theory and practice must take allowance for the fact that the investigator must be able to generalize from the sample data to a large universe of more or less equivalent data that might have been gathered. He must be able to generalize not only to a universe of tests but also to a population of persons.

Statistical Inference and Factor Analysis

Theoretical statistics has done relatively little toward providing factor analysis with the kinds of inference models most useful to it. This is largely a result of the complexity of the problem of dealing not only with multiple variables but also with the possibility of rotation to some criterion of simple structure, to say nothing of a criterion of meaningfulness.

The rigorously derived estimation procedures of Lawley (1940, 1953), Rao (1955) and Joreskog (1962, 1963, 1965) are notable examples. Provided the factors are estimated by the suggested methods, these authors have developed significant tests for the hypothesis that a given number of factors is necessary in order to account for the data. Bargman (1953) provides a statistical test of the hypothesis that a given set of the factor loadings possesses simple structure rather than being scattered haphazardly through the factor space. Joreskog (1965) provides a statistical test of the related hypothesis that the zero loadings defining a simple structure fall in specified places in the factor matrix

Psychometric vs. Statistical Approach to Factor Analysis

The evidence concerning sampling fluctuations in factor analysis has always been considered from two points of view. First, the statistical, in which sampling fluctuations are the result of sampling of persons. This approach seeks to generalize from the data to a population of persons. Second, the psychometric, in which the resulting fluctuations are due to the indeterminancies in what is being measured. This approach attempts to generalize from the data at hand to a universe of measures.

Monte Carlo Methods

Where questions of practical interest have been too complex or too difficult to specify mathematically for analytical solution, the Monte Carlo approach is most appropriate. This procedure involves generating by some random process samples from some specified population. The relative frequency of result is tabulated in order to form the sampling distribution of a statistic which is of interest, but whose sampling distribution is too intractable mathematically to offer analytic solution. Sampling errors in factor analysis would appear to be appropriate for the Monte Carlo approach.

Sampling Error in Factor Analysis

A researcher who uses factor analysis should normally be concerned, at least implicitly with the size of the sampling fluctuations that he can expect for the factor loadings he is attempting to estimate. At the very least, he wants to know whether he can expect a radically different structure for the same variables if he obtains another sample from the same population. He is also concerned with the probability that a given loading is different from zero, i.e. whether or not it is significant in the usual statistical sense. The results in this area leave a large gap where the needs of the investigator are unsatisfied. The statistical tests which are available, such as Lawley's (1940) and Rao's (1955), have to do with the number of factors rather than with the size of loadings. Except for Joreskog's test (1966) for the significance of the deviation from a hypothesized simple structure pattern, little exists in the way of procedures for coming to conclusions about the population size of a particular loading.

Review of Research

Previous research on factorial invariance has centred on :

1. indices of and criteria for factor matching, i.e. empirical apporach (Cattell 1949, Harmon 1960, Leyden 1953);
2 proving mathematically that a method of rotating factors exists, which will be invariant from study to study, i.e. theoretical approach (Ahmavaraa 1954); and
3. testing the sampling error of factor loadings (Spearman and Holzinger 1924, McNemar 1941)

Indices of and Criteria for Factor Matching

Harmon (1960) states that the measure of consistency of factors, for a fixed set of variables from sample to sample, would seem to be a classical problem in the theory of statistical sampling. However, little progress has been made toward the solution of the sampling problem.

Cattell (1949) suggests the use of the method of coincidence and of marker variables. He states that factors shall be considered matched or invariant when the most heavily loaded one-sixth of the variables in one factor has at least 50 per cent of items in common with the one-sixth of the variables that are most heavily loaded in the second factor.

Cattell and Baggaley (1960) proposed a non-metric parametric technique. This method uses marker variables and obtains an estimate of the probability of matching pairs of factors in two different studies

Harmon (1960) proposes a simple root mean square formula for measuring agreement between corresponding factors weights. He also gives a formula for a coefficient of congruence to measure the congruence between pairs of factors in different studies. In addition, he states that these ideas were independently developed by Burt (1948), Wrigley and Neuhouse (1955), and Tucker (1951)

Leyden (1953) conducted an interesting study which points out great discrepancies in the results obtained by these different empirical methods. His study was reinforced by Pinneau and Neuhouse (1964), in which they also found large discrepancies in these methods. However, they go one step further and suggest two new procedures for measuring invariance . (1) the coefficient of invariance for factor loading, and (2) the coefficient of factor similarity.

Patterson (1965) measured factorial invariance through the intercorrelations of factor loadings from different studies. In his results he states that when a broad range of factors are intercorrelated, low correlation results However, when these factors are combined into two general factors, a large correlation is obained.

The Theoretical Approach

Some researchers feel the way to solve the problem of factorial invariance is by developing a better theoretical structure of factor analysis and of statistical sampling in factor analysis.

Ahmavaraa (1954) has done most of the recent "mathematical" work in factor invariance. He offers a mathematical proof of Thurstone's results and shows that simple structure is invariant under selections.

Werdelin (1962) developed a method of rotating the factors of a certain study to a pattern determined by the factors of another study. By applying this to two independent samples of data, he obtained a method of rotating a factorial solution to a structure given by his previous sample and a method of checking whether the two studies are congruent.

Meredith (1964) describes how an invariant factor pattern matrix exists that describes the regression of observed loadings on factor variables in different sub-populations. Also, this invariant factor pattern matrix is not unique.

Testing the Sampling Error of Factor Loadings

Spearman and Holzinger (1924), who had previously tested the sampling error of tetrad differences, were the first to study sampling errors of factor loading.

McNemar (1941) reported the first real empirical study on sampling fluctuation of centroid factor loadings. He conducted three empirical studies, the first based on available data on eight variables for 700 cases. These were factored to three factors. In the second study the data was fictitious and provided 2,500 cases. The last was based on real data for nine variables and 7,000 cases involving separate factorization for 35 samples of 200 cases.

These three studies agreed in showing that the sampling behaviour of first centroid factors was much like that of correlation coefficients; whereas the sampling fluctuation for loadings beyond the first were disturbingly large. McNemar's study was limited by the small number of variables used to define the factors and the lack of communality estimates which would result in slightly greater stability of the factor loadings.

To test the sampling error of factor loadings one would need a large number of repeated samples of data based on a test battery having the same factor composition. In addition, one would need computer facilities for performing a large number of factor analyses.

Employing large number of replications of batteries in dealing with empirical data has never been feasible. The major drawbacks with this method have been with matching the experimental variables underlying the hypothesized factor pattern, equating experimental samples from populations, and finally the formidability of the computations involved. The advent of large computers has alleviated these difficulties and made this type of study possible.

A potential source of factor invariance can be seen from an examination of the general linear model used in factor analysis. Each variable Z_j is considered to be a linear function of all common factors determined to be necessary from reduction of the order of a correlation matrix and a unique factor that supposedly does not enter into the correlations with other variables. This expression is given by

$$Z_j = a_{j1} F_1 + a_{j2} F_2 + \ldots a_{jm} F_m + a_j U_j \quad (1)$$

where $F_1, F_2, \ldots + F_m$ represents the common factors, U_j is the unique component, and the coefficients, a_{jk} are the factor loadings or weights. The general assumptions made about these are that the factor scores have means of zero and unit variance. The set of linear equations representing all variables is called a factor pattern. Harmon (1960) assumed that the common factors in a pattern may or may not be correlated, but that the unique components are uncorrelated with other unique factors and with other common factors

Hamburger (1965) observed the sampling behaviour of the factor loadings of a pre-determined factor pattern He also studied the relative amount of fluctuation from population values that occurred through direct and combined effects of the experimental conditions

Bechtoldt (1961) used eight analyses of two sets of data to demonstrate the procedures and results of a confirmatory study with statistical tests of some, but not all, relevant hypotheses in an investigation of the invariance hypothesis. The empirical results provided estimates as substitutes for unavailable sampling formulations.

Cliff and Pennell (1967) employed the Monte Carlo approach in determining whether or not communality, factor strength, and loading size produce systematic effects on the sampling variability of individual factor loadings

The consequences of the sampling of persons must be examined and taken into account if factor analysis is to be a useful inferential tool. Many kinds of sampling errors exist in factor analysis corresponding to the various universes that may be sampled, as well as the variety of quantities (loadings, communalities, factor profiles, factor sizes, etc.) that may interest the investigator. Monte Carlo studies of sampling errors in factor analysis have been relatively few

Cliff and Hamburger (1967) present evidence concerning sampling fluctuations in factor analysis, with an emphasis on data gathered from Monte Carlo studies. This evidence is given concerning the influence of the type of factoring, size of loading, and method of factorings on factorial invariance Their findings point out that the standard errors are somewhat smaller than $1/\sqrt{n}$, i e , the approximate standard error of a zero correlation Hamburger's data are especially encouraging since he found that analytically rotated factor loadings are remarkably stable across samples

A word of caution, however, since in his data not a question is raised as to the number of factors to rotate Also, there are only four true factors and no small nuisance factors to muddy the picture

Pennell (1968) utilized the Monte Carlo approach to demonstrate the dependence of factor loading sampling error on the communality of the test or variable on which the loading occurs. Also, the effect of an additional independent variable, N, the number of persons upon which each sampling is based, is studied. Pennell shows that increasing N, or communality, results in decreased sampling error of individual factor loadings, but for zero loadings, N has the greatest influence. Another interesting discovery is that distributions of factor loadings become relatively elongated as communality increases.

Rosenblatt (1969) uses the method of writing a linear model for a number of test scores to obtain repeated samples of scores containing the same factor composition. Each of a number of factor models generate samples which are factor analyzed. The stability of the factor loadings over the number of samples are then compared. The limitation in his study is the use of principal component analysis and varimax rotation. With the newer rotational schemes this study is relatively outdated.

Summary and Conclusions

The study of sampling errors in factor analysis has traditionally been approached from two conceptualizations: the psychometric and the statistical. In the psychometric approach, the difficulties in estimating the factor loadings of the variables arise out of the sampling of the universe of variables and from the indeterminancies resulting from the possibility of rotation.

The statistical concept of factor analysis directs its attention to the estimation of factor loadings when the sampling is of persons. Here it is assumed that for any given set of tests there exists a population value for the matrix of factor loadings and that the problem is to estimate these population values from the sample data. The consequences of the sampling of persons must be examined and taken into account if factor analysis is to be a useful inferential tool.

Many kinds of sampling errors exist in factor analysis corresponding to the various universes that may be sampled, as well as the variety of quantities (loadings, communalities, factor profiles, factor sizes, size of N, etc.) that the investigator may be interested in

Monte Carlo studies of sampling errors in factor analysis have been relatively few and that these do exist have concentrated on the person-sampling approach. The reason for this seems fairly clear. Here the universes are defined clearly enough to provide more or less straightforward means of generating random samples.

Hamburger (1965), Joreskog (1963), and Browne (1965) show that the sampling errors of single loadings are in the neighbourhood of $1/\sqrt{n}$

(at least for well-defined factors), much like the standard error of a correlation. These results indicate that the loadings in a sample matrix should differ from an hypothesis matrix only by $1/\sqrt{n}$ on the average if the sample is rotated to the hypothesis However, the results are far from being either exact or extensive enough to warrant the routine reporting of "significance" levels in the literature

All the above studies cited have dealt with factors that were uncorrelated in the population, although they may have rotated sample data obliquely Correlated factors may behave differently, so generalization of the statements concerning sampling characteristics of rotated loadings should be limited to the orthogonal case.

Joreskog's (1963) results indicate that under certain conditions sampling errors of unrotated loadings are likely to be so large as to render them useless as estimates of anything

The influence of the number and size of the factors and the number of variables seem to require further explanation. The degree to which whole factors remain invariant across samples has not been studied from the person-sampling approach. It is worthy of study since the investigator is often more interested in this question than he is in single loadings.

Another limitation to the previous studies is the absence of the newer rotational method such as the Kaiser-Harris rotational procedure and the promax rotation.

Many aspects of factor invariance need to be studied. Some answers to the questions in this field are becoming available and, for the most part, they indicate that the purely statistical aspects of the problem of the stability of factor loadings are encouragingly small. Now that the ground work has been laid and extremely high speed computers are available, future studies using the Monte Carlo approach should provide the information which will put factor analysis on a more firm statistical foundation.

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Learning through Seminars

An Experience

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This paper deals with seminar as a learning activity. The author has described the mechanism of seminar and also reported about the reactions of seminarians to a series of 24 seminars. The results indicate that the participants have found seminars as a useful method of learning. They have also offered suggetions for the improvement of this activity

IN ANY INSTRUCTIONAL SITUATION, the learner continuously interacts with his environment which includes men and material. This interaction aims at stimulating the mental activity of the learner to result in learning. Human interaction is markedly different from the interaction with material in terms of its potential to cause learning The main difference lies in the fact that in human interaction, the situation is continuously changing. This continuous change is primarily because of the involvement of human beings who have the capacity to react to any stimulus. The response made by an individual will act as stimulus for the other, thus generating a series of new stimuli. This necessitates that the learner develop the ability to respond to ever-changing situations. Ability to respond in this manner would involve higher cognitive actions of a quick comprehension of the situation, examination of it against the knowledge he possesses and construction of his reaction to the situation. Unlike human interaction, the situations involving interaction with material are comparatively more static with regard to the presentation of the stimuli. And, thus, these situations will have less potential to develop the higher cognitive abilities as compared to the situations involving human interaction. As the development of higher cognitive abilities is essential at any stage of education, techniques involving human interaction will have a definite place in any instructional scheme. Several instructional techniques have been evolved with human interaction as underlying pedagogical principle, viz. a discussion, seminar, panel discussion, debate discussion, buzz session, brain-storming, role-playing, etc. Discussion in this paper is, however, confined to the technique of seminar.

Mechanism of Seminar

Seminar as an instructional technique involves creating a situation for a group to have guided interaction among themselves on a theme which is generally presented to the group by one or more members. The person who presents the theme should have studied the theme thoroughly beforehand. This would mean selection of relevant material and its organization. Generally, this organized material is put in the form of a paper which is circulated among members in advance. The paper helps structure the theme, facilitates its communication, and focuses the scope for discussion After the theme is presented, it is discussed by the group. During the discussion participants may (i) seek clarifications of the theme presented, (ii) make observations in the light of their knowledge and experience regarding the theme, and (iii) raise issues relating to the theme for further analysis and evaluation. Proceedings of the seminar will be guided by a chairman who may be knowledgeable about the theme. The chairman's role would be to keep the discussion on track, stimulate maximum participation and consolidate at appropriate stages the viewpoints expressed. Seminar as an instructional technique seeks to provide maximally for interaction among the members This means that sufficient time should be allowed for the discussion session ; if this necessitates cutting down the time for presentation, it could be done since the main purpose of the presentation is to initiate the discussion

The interaction in a seminar can be likened to the field of forces in mechanics. Different viewpoints or opinions expressed will represent forces in varied directions However, unlike physical forces which when acting in opposite directions, at times, result in zero, the differing viewpoints or even opposite opinions will not result in neutrality but will induce further thinking among participants. It is this stimulation for further thinking that should be reckoned with significance as the net instructional value of the seminar When there is an agreement of ideas among individual members, these may be considered as forces acting in the same direction and thereby having a reinforcing effect on the individual's view on the theme. In either cases the individual is benefitted as he is either led to further analysis and evaluation of his viewpoints, or helped in validating and thus strengthening them.

From the above analysis of the basic mechanism of interaction in seminar, it may be inferred that the seminar as an instructional technique has the potential to develop several abilities in students. Due to the process stimulation of thinking brought about through interaction, different higher cognitive abilities like, analytical and critical thinking, synthesizing and evaluating the ideas will tend to be developed. Apart from these cognitive abilities, certain affect attributes like tolerance for other's views, openness to ideas, cooperation with others, emotional stability and respect for others' feelings will be inculcated among the participants during the course of such sessions. These affect attributes represent the norms of behaviour for the group in the seminar situations. Moreover, these norms are the same as those of a democratic society. Deliberate efforts to adhere to these norms would of necessity be made during the course of seminar discussions. The adherence to these group norms would gradually inculcate the affect attributes in the participants.

Concomitant effect of seminar as instructional technique will be the development of better learning habits. While preparing for presentation and participating in the discussion, learners will get induced to pursue independent study, engage in post-seminar discussions covering the themes discussed as well as related ones, develop a critical outlook to any idea thereby leading the learner to self-initiated learning which will be more permanent in nature.

As can be seen from the above, seminar has great instructional value as it makes the instruction learner-centred and provides for learning through enquiry which is based on a very natural characteristic of inquisitiveness in humans. This natural way of learning through seminar establishes an important place for this technique at all level of instruction. From the practice, however, one may notice that it is mainly confined to higher education. Such a situation seems to have arisen mainly from the presumptions that the technique demands maturity in terms of language, social and emotional makeup and the facility to deal with abstractions. Since the students at lower levels of education do not possess the maturity to this extent, it is generally considered that seminar is less feasible to be adopted as an instructional technique at these levels. Such a demarcation of feasibility regarding the use of seminar stems from the rigid notion about the nature of themes to be discussed therein. It is generally considered that the seminar should have an abstract theme to be presented and discussed Although there is nothing against the suitability of such themes for seminars, confining seminars only to cover these is more of historicity of the technique rather than its demands about the nature of the themes In fact the value of seminar should be seen in terms of the basic mechanism of the involvement of learners. Here the learners are expected to present to others their ideas or experiences who would react to them in the light of their own experiences. And, it is this interaction on the ideas or experiences, however high or low, concrete or abstract they may be in nature, that should be aimed at through this technique. Seeing seminar in this perspective, it may be quite feasible to utilize this technique effectively even at lower levels of instruction At these levels the themes for seminar could be even simple and concrete experiences which could be narrated to fellow children who in turn could discuss them in the light of their own. Interaction on such themes also would involve behaviours like questioning, making observations, evaluating the theme by comparing it with their own experiences, etc., on the part of learners, which are characteristics of seminars The present paper, however, discusses experiences gained through the organization of weekly seminars for research students over a period of three semesters at the Centre of Advanced Study in Educaction, M S. University of Baroda

Background

Organization of seminars at the Centre has been a feature of its academic programmes since its inception in 1964 However, these seminars did not have a fixed structure in terms of frequency, duration student involvement, etc to the extent that this programme could be institutionalized. With the liberalization of registration rules for the Ph.D in Education at the Centre in the year 1973 with a view to encouraging interdisciplinary approach to educational research, even candidates from different disciplines who did not have degrees in education were admitted. By then the Centre had established itself as a national centre for educational research with adequate academic facilities The liberal policy of admission, which is not the case with most universities even today and the special status the Centre had acquired brought a considerable increase in the number of Ph.D. students coming from all over the country and a few from abroad. With this increased number of research students with varied backgrounds, it was a felt need to institutionalize the feature of seminars and to utilize it for providing a forum for free interaction on educational problems whereby participants may gain from the scrutiny of these problems through different viewpoints. It was thus decided to hold weekly seminars on a regular basis from June 1976.

Organization

Two senior staff members were made responsible for organizing the seminars. These conveners informally discussed with colleagues and research students to plan out the framework of the seminar series. The framework evolved is given below :

1. The seminar may be conducted every Tuesday. The choice of the day was made in view of the schedule of work at the Faculty.
2. The duration of these seminars was two hours to allow sufficient time for discussion.
3. The presentation of papers may be made by staff members and research students.
4. Students may present their research work at any stage of its progress. For presentation on other topics of their interest, they could take another chance.
5. The papers for presentation will be duplicated and distributed in advance.
6. Proceedings of each seminar will be conducted by a chairman from amongst participants.
7. Each student gets an opportunity to present
8. All research students have an obligation to attend seminars.
9. Seminars may be open to all those interested.

With this framework 25 seminars were conducted during the two semesters of the year 1976-77. Details of these seminars are given in the Table.

A few details regarding the mechanics of the organization of the seminar series may be mentioned to clarify further its functioning. Through informal sessions with the research students and the staff members, the conveners tried to persuade them to make presentations in the series. In case of research students it was mainly through encouragement if they happened to mention about their studies or other educational problems, and also in helping them in the preparation of papers for presentation. Senior members of the faculty were especially requested to present papers and participate in the seminars. This was done in order to create a supportive social climate regarding this academic programme in the faculty. The participants were assured by the conveners of the freedom to express their opinion and offer constructive suggestions regarding the organizational aspects of the seminars to make them more effective. Conveners also arranged for the systematic recording of the proceedings of each

TABLE

SEMINARS HELD DURING TWO SEMESTERS 1976-77

Area	*Total No of Seminars*	*Presented by*		*Team**	*Head*	*Chairman*		*Head*
		Research Fellows	*Staff*			*Research Fellows*	*Staff*	
1 Teaching Technology	5	4	—	1	—	1	3	1
2. Teacher Education	4	—	2	1	1	—	1	3
3. Sociological Studies	4	2	1	1	—	—	—	4
4. Innovations	2	1	1	—	—	—	1	1
5. Higher Education	3	3	—	—	—	1	1	1
6 Psychological Studies	2	2	—	—	—	1	1	—
7. Miscellaneous	5	1	3	—	1	—	2	3
Total	25	13	7	3	2	3	9	13

*Of the three team presentations one was by two research fellows and the remaining two were by one staff member and one research fellow each.

Note : Tuesday seminars remained suspended in the event of any other seminar organized by the Centre or outside agency, or if Tuesday happened to be a holiday.

seminar to observe the extent of participation and thereby attempt to maximize participation through informal discussions. Further, it was decided to place on record in the library at the Centre, a copy of any paper presented under this series for future reference.

At the end of the academic year during which 25 seminars were held, an evaluation of this series was made to get opinions of the participants with regard to the benefits derived from the series, and also suggestions for improving academic and organizational aspects of this programme. For this purpose, an evaluation tool was developed by the authors. The tool consisted of multiple-choice as well as open-ended items regarding different aspects of the series A few items referred only to research students while others were responded to by both research students and staff members. Twenty-two research students and eleven staff members responded to the questionnaire. Responses were analysed in terms of percentages for various responses. Content analysis was carried out wherever needed.

Evaluation Results

Of the research students who presented their projects, 90 per cent stated that they benefitted through this experience in terms of getting a greater insight into their research problems, and confidence in making presentations before others. Through the presentations made by others, to which research fellows and staff members responded, there was an expression of benefit regarding conceptual understanding of other areas and the methodology used therein and a positive influence on their ways of presentations through an exposure to other styles of presentations. Team presentations were generally considered useful as they provided better scope to examine the problems from various viewpoints. A large majority (88 per cent) of respondents opined that presentations ought to be made both by research fellows and staff and not be restricted to any one category mainly because the former could benefit throgh the richness of experience and depth of knowledge of the latter. Regarding the mode of presentation, the most popular view could be made during presentation rather than reading the paper or not consulting it during the presentation. One item regarding presentation to which only research fellows were to respond was regarding the stage of work at which one would like to present a seminar paper. A good number of respondents (50 per cent) opined that this could be done at each main stage of the research work. However, a small number maintained that they would like to present their papers at the end of the research work Perhaps this reflects that proper attitude towards the benefits to be derived to improve one's own research problem through interaction with fellow researchers has not been developed in them.

With regard to the topics of presentation, all respondents were of the opinion that varied topics should be presented. Research methodology was the most preferred area for future presentation of seminars. All but one of the respondents were in favour of having presentations by experts from related disciplines

Participation in seminars influenced the development of certain affect attributes in participants like openness to others' ideas, objective outlook, confidence and emotional stability. All respondents expressed that seminars improved their academic habits in that they were stimulated to post-seminar informal discussions which further led to reading more on topics discussed. Similarly, all respondents opined that the participation in seminars helped them develop their viewpoints on various issues.

Most respondents (48 per cent) preferred that a question be discussed immediately after it is raised by participants. A few (39 per cent), however, thought that a set of questions could be discussed intermittently. Very few preferred that all questions be raised first and then discussed together. For an effective seminar, the respondents defined the role of the chairman which would be to direct, summarize the discussions, redress, also increase participation and check unduly prolonged discussions on a particular point with the exception of two respondents, all others expressed that prior circulation of papers to be presented proved beneficial since it helped in acquainting oneself with what was to be presented and in stimulating thinking on the theme.

Sixty-four per cent of respondents stated that by acting as chairman, one developed skills to direct group activity and learned to integrate ideas and place them coherently. They opined further, that one developed a greater objectivity. With regard to chairing of seminars, 76 per cent of respondents expressed that it should alternate between research fellows and staff members. The reason stated for this choice was that it would generate a climate of fellowship in learning and would give to research students the benefit of experience. Only 6 per cent of the respondents thought that the Head of the institution should chair the seminar, while some (6 per cent) preferred to leave the choice of the chairman to the speaker.

The opinion of respondents was sharply divided with regard to the periodicity of the seminar. A majority of respondents (72 per cent) thought that a duration of hours was sufficient for these seminars. Eighty-two per cent of respondents felt that the time devoted to discussion was sufficient These respondents felt that for certain topics, the time devoted was not enough. Two respondents, however, expressed the need to increase the duration of discussion for all the topics.

Concluding Remarks

Effective organization of the weekly seminar series demanded continual informal interactions among the group members regarding various aspects of the seminar. These interactions were initiated by the conveners and utilized for generating a free and frank atmosphere in which most group members cooperated and shared responsibilities for the effective conduct of the seminars. Involvement of group members in different aspects of this programme, as a team with a common objective of its successful implementation accounted for its effectiveness. However, as is natural to any innovative process, certain difficulties arose while running this programme, viz initial hesitation on the part of group members to present their work, misunderstandings created among certain members by remarks made during discussions, lack of emotional stability displayed by a few members, etc. Such difficulties were resolved through informal, persuasive interactions and by involving them to a greater extent in the programme. Further, involvement of the Head and the senior members of the staff helped to a great extent in creating seriousness in and prestige for the programme, and thereby helping enlist greater cooperation of group members which resulted in the institutionalization of this innovation.

While discussing various educational problems in the seminars, it was observed that certain aspects of those needed a thorough examination from theview points of other disciplines. This need was reflected in the responses of 97 per cent of participants who suggested in order of preference that experts from sociology, psychology, economics, statistics, philosophy and political science be invited to make presentations. This inter-disciplinary approach to educational research is all the more necessary at this Centre which has on its roll members from various disciplines, who are engaged in pursuing research studies in education. Considering the fact that educational research is of recent origin in the country and that a suitable methodology for tackling various problems is yet to be sharpened, greater involvement of experts from other disciplines would enrich the understanding for educational problems. This would lead to forming inter-disciplinary working teams to deal effectively with problems of educational research development.

Follow-up

In the light of experiences gained through conducting the seminar series over a period of two semesters and the evaluation done at the end, a few changes have been incorporated to make the seminar more effective.

In response to a popular demand for the discussion on topics of varied nature, another series of seminars has been instituted every Saturday. This series provides a forum for discussion of methodological concepts and issues in educational research. In all 12 Saturday seminars were held. In order to meet yet another demand of inviting experts from other disciplines, a special series of seminars was added to the existing Tuesday seminars and Saturday seminars. Four seminars by an expert in psychology were organized under this special series. To accommodate the convenience of experts from other disciplines, the series is flexible with regard to its periodicity and time schedule. Eleven experts from the disciplines of economics, sociology, management, science, statistics, communication, philosophy and psychology are scheduled to present seminars under this series subsequently.

It may be recalled that the respondents were highly in favour of team presentation especially through the argumentative approach as it seemed to them to have a greater potential to stimulate critical thinking. Two presentations were subsequently attempted with this approach. Favourable reactions of most participants substantiated the finding of the evaluation conducted earlier on this point.

It can be seen from the Table that more than half the seminars were chaired by the Head. The Head was specially invited to chair sessions in order to bring about seriousness and create prestige for this programme among group members to facilitate the institutionalization of this innovation. This practice of making special efforts to involve the Head was deliberately not pursued in the subsequent semester as it was felt that the seminar series got intrinsic acceptability with the group members. To further develop initiative and involvement of members in this programme, the practice of formal weekly notification was discontinued. With sustained efforts by the group members, the seminar series has been institutionalized as an effective instructional technique to help research students develop attributes needed for accomplishing scientific tasks in the field of education. This is perceived not only by the research students of this Centre but also by the research students in others faculties of this university as evident from the fact that a number of them come, on their own, regularly and participate in the deliberations of the seminars. ☐

Assessment of Psychometric Invariance Across Sex Groups

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The present study examines the psychometric invariance (structural stability) of the WAIS sub-scales across the sex groups. One hundred male and 100 female subjects in the age range of 18-34 years were individually given all the eleven scales of WAIS and 13 marker variables in small groups. Using a computer programme, the raw scores of all the 24 variables were intercorrelated and factor analysed by the method of principal axes solutions which were further rotated to Varimax solutions, separately for males and females. The factors in both the groups were then interpreted and matched across the groups. The rps between patterns of factor loadings of the WAIS scale across groups revealed information, comprehension, digit span, vocabulary, and object assembly scales as psychometrically invariant and arithmetic, similarities, digit symbol, picture completion, block design, and picture arrangement as psychometrically non-invariant scales The implications of the non-invariant scales were discussed in the light of test theories.

THE PRINCIPLES OF PSYCHOMETRIC INVARIANCE ASSESSMENT have been elaborately dealt in many recent studies (Aftanas 1971a, Puhan 1974, 1975a, 1975b, 1977a). Based on Guilford's (1948) model of test contents, these studies assume that a test measures as many behavioural domains as the number of contributing factors to its variance and measures to the extent indicative by the corresponding factor loadings. Keeping this in view, Aftanas (1971a) pointed out that psychometric invariance assessment consists of determining the degree to which the sources of variability associated with a measure are invariant under conditions or change—some such conditions being developmental, cultural and behavioural. Psychometric invariance, therefore, requires that the structural (factor loading) stability of a measuring instrument must be achieved across certain dimensions against which it is intended to be used (Puhan 1975a, 1975b). There could be many dimensions that are capable of inflicting changes in the structural aspect of a test. Broadly speaking, these dimensions may be developmental (age groups), behavioural (neurotic, normal groups etc.), cultural (Indian, Canadian etc.), and sex (male and female).

Psychometric invariance assessment in developmental dimension has already been examined by Aftanas (1971b) and Puhan (1974, 1975a). Such assessments have also been worked out across cultural dimension (Puhan 1975b). All these assessments have suggested that psychometric invariance of many Wechsler Adult Intelligence Scales (Wechsler 1955) have never been achieved. In this connection, Puhan (1975a) has already cautioned that lack of psychometric invariance across any dimension may have serious implications to the meaning of the test Such a situation would indicate that the concerned test may be perceived differently by subjects belonging to different groups in that dimension (Puhan 1975a).

Like age and culture, sex is also an universal factor which is likely to induce changes into the meaning of the test However, no attempt has yet been made to examine psychometric invariance of tests across sex groups. The present study, therefore, intends to examine the requirements of psychometric invariance of a standard ability test (e g. WAIS sub-scales) across two sex groups.

Method

Sample

A total of 200 subjects (i e., 100 in each sex group) were tested for the present study. One hundred and ninety subjects were drawn from the introductory psychology classes of the University of Manitoba who participated in the study as a part of their course requirements. The remaining ten subjects who belong to the female group were volunteers and participated in the study to get some general feed-back about their performance on various ability tests. All the subjects of the present study constituted the sample under another study (Puhan 1974) and were within the age range of 18-34 years. They were all Canadian citizens or were living in Canada for at least ten years at the time of testing.

Description of the Variables

Main Variables : In the present study the WAIS sub-scales (Wechsler 1955) were labelled as main variables because their psychometric invariance requirements were under investigation. This test consists of Information (Inf.), Comprehension (Comp.), Arithmetic (Ar.), Similarities (Sim.), Digit Span (D Sp.), Vocabulary (Voc.), Digit Symbol (D. Sy.), Picture Completion (PC), Block Design (BD), Picture Arrangement (PA), and Object

Assembly (OA) sub-scales. The contents and nature of these tests have been described by Matarazzo (1972) and Puhan (1974) in full detail.

Marker Variables : The basic methodological objective of the present study was to manipulate a factor analytic situation which would result in greater accountable variance ($h^3\_$) for each of the WAIS scales. For it is argued that the accountable variance may be raised to an appreciable level before psychometric invariance of any kind can be conclusively studied (Aftanas 1971a). One way to approach the problem of raising the accountable variance of any tests has already been suggested by Comrey (1973). He pointed out that inclusion of marker variable in factor analysis will mark different and new factors which would not have appeared otherwise. This has already been demonstrated in a recent study by Puhan (1977b). He found that the inclusion of marker variables increased the number of interpretable factors, which, in turn, contributed to the variance of a test, thus adding to the magnitude of its accountable variance. Since psychometric invariance assessment presupposes appreciable accountable variance of the tests under investigation, it was necessary to include a number of marker variables in the present study Accordingly such marker variables were searched for and examined with regard to their suitability for inclusion in the present investigation. Finally, Verbal Reasoning (VR), Space Relations (SR), Clerical Speed and Accuracy (CSA), Language Usage-Spelling (LU-S), Language Usage-Grammar (LU-G), Numerical Ability (NA), Abstract Reasoning (AR), Mechanical Reasoning (MR) Scales of Differential Aptitude Tests (Bennett, Seashore, and Wesman 1966), Series (Ser.), Classification (Cl.), Matrices (Mat.), and Conditions (Con.) of Culture Fair Intelligence Tests (Cattell, and Cattell, 1959) and Advanced Progressive Matrices (PM-A) of Raven (1947) were selected as marker variables. Most of these scales are supposed to be factorially less complex—a condition that characterizes a variable as the best marker (Comrey 1973).

Procedure

All the subjects were tested on Wechsler Adult Intelligence Scale (Wechsler 1955), Differential Aptitude Tests (Bennett, Seashore and Wesman 1966), Culture Fair Intelligence Tests (Cattell and Cattell 1959) and Advanced Progressive Matrices (Raven 1947). Each subject of the present study had to go through four testing sessions out of which one was an individual session and rest three were group sessions consisting of 10-15 subjects. All tests were administered in strict accordance with the instructions provided by the respective test manuals. The other details of the testing procedure appear elsewhere (Puhan 1974, 1977b).

Preliminary Analyses

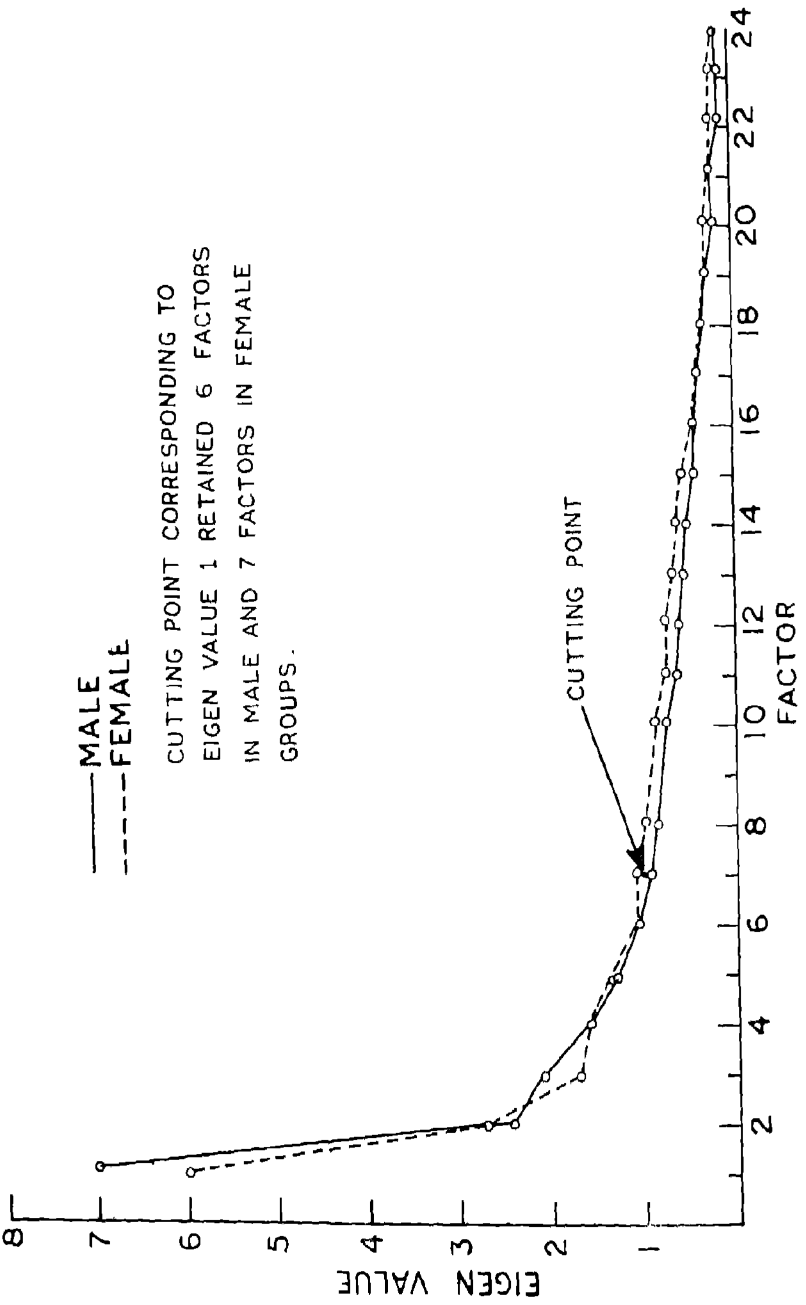
The analyses of the present study were based on the raw scores of the twenty-four variables and were performed on the IBM 360/65 computer at the University of Manitoba Computor Center The programme which was used for the present study involves Pearson's Product Moment Correlation among all the variables It also involves a principal axes solution of the Correlation Matrix (Hotelling 1933). The programme further rotates the principal axes factors to an unique varimax analytic solution (Kaiser 1958). Two separate analyses were thus performed for the male and female groups.

Results

1. Factor Solutions

It could be recalled that the basic objective of the present study was to compare the factor structures of WAIS sub-scales across sex groups. Such a comparison presupposes equal number of similar factors in both the groups. It was, therefore, necessary to examine the eigen values and select one from each of the groups that would result not only in equal number of similar principal component factors but also meet closely the criterion of "positive generalizability" (Kaiser and Caffrey 1965) and the 'scree test' (Cattell 1966). According to Kaiser and Caffrey an eigen value of 1.00 is arbitrarily considered a point corresponding to the criterion of positive generalizability The scree test, on the other hand, involves plotting all the eigen values against the factors and selecting a point where the curve approaches a straight line which is recommended as a cutting point to retain factors Finally, eigen values of 1 00 and 0.90 were chosen for the factor analyses of the male and female groups, respectively. These two cutting points were most acceptable for the present investigation because they were in the neighbourhood of 1.00 (criterion of positive generalizability), met the criterion of scree test (see Fig. on page 58), and resulted in an equal number of similar principal component factors for both the groups; the last being a unique requirement in the present investigation.

SCREE TEST



CUTTING POINT CORRESPONDING TO EIGEN VALUE 1 RETAINED 6 FACTORS IN MALE AND 7 FACTORS IN FEMALE GROUPS.

The principal axes solutions were further rotated in accordance with the varimax criterion (Kaiser 1958) which approximates Thurstone's (1947) requirements of 'simple structure' and 'positive manifold'. The varimax rotation was chosen over other techniques because of the orthogonality (independence) among the resulting factors which is needed for matching the test's factor structures. These varimax solutions appear in Table 1 and Table 2 for the males and females, respectively.

TABLE 1

VARIMAX FACTORS FOR MALE GROUP

Variables	*Factors*						
	I	*II*	*III*	*IV*	*V*	*VI*	*VII*
1. Inf	004	—717	001	072	257	—108	121
2. Comp.	—064	—814	015	—021	—049	—108	—287
3. Arith.	426	—095	255	020	330	—026	—584
4. Voc	402	—634	080	142	008	—020	215
5 D Sp.	099	055	891	003	—036	085	—044
6. Sim.	135	—701	068	—106	462	—083	—016
7. D Sy.	106	122	—506	516	258	—310	—243
8. PC	089	—150	825	120	058	—343	—056
9 BD	413	—107	—179	—018	—026	—709	—226
10 PA	140	—084	373	055	369	—504	—159
11. OA	239	—096	096	—119	023	—736	287
12 VR	575	—361	038	169	412	—210	031
13. SR	664	—282	126	—118	—042	—417	—132
14. CSA	035	—074	105	837	—003	073	028
15. LU-S	—047	—165	—044	085	847	016	—106
16. LU-G	430	—387	—009	—008	498	—143	140
17. NA	531	—023	—127	441	269	146	118
18. AR	746	082	082	252	090	—305	—121
19. MR	641	—340	091	—115	—012	—199	—188
20 PM-A	606	—113	152	065	—029	—396	—043
21. Ser	662	035	—061	—143	112	—108	081
22. Cl.	402	—132	174	270	137	—352	357
23. Mat	747	—008	178	289	—096	—030	—050
24. Cond.	309	—343	120	216	—244	—257	—220

Note : Decimal points omitted.

2. *Interpretation of Factors*

Ordinarily, variables with factor loadings .30 and above are examined to identify factors (Harman 1970). However, such a figure may not always prove to be scientifically noteworthy while interpreting factors

TABLE 5

SCALE POSITIONS OF THE INNOVATIONS ACCORDING TO STUDENTS

INNOVATIONS	*K*	*D*	*H*	*B*	*E*	*I*	*C*	*F*	*J*	*A*	*L*	*M*	*G*
K	(.000)	0.151	0 759	0.625	0 962	1.019	0 885	1.054	0.962	0 786	1 476	1 293	1 216
D	—0.151	(.000)	0 542	0.311	0.462	0 668	0.462	0.423	0 713	0 786	0.713	0.668	1.216
H	—0.759	—0.542	(000)	—0.060	0.524	0.259	0.524	0.407	0.759	0.885	0 625	0 806	0.713
B	—0.625	—0 311	0 060	(000)	0.396	0.095	0.650	0.542	0.485	0 739	0.583	0.311	1.216
E	—0 962	—0.462	—0 524	—0.396	(000)	—0.116	0.080	0.274	0.311	0.485	0 856	1.117	1.293
I	—1 019	—0.668	—0.259	—0.095	0.116	(.000)	0.010	0.238	0.348	0 259	0.542	0.583	1.080
C	—0.885	—0.462	—0.524	—0.650	—0.080	—0.010	(.000)	0.311	0.274	0.445	0 502	0.311	0 202
F	—1.054	—0.423	—0.407	—0.542	—0.274	—0.238	—0.311	(.000)	0.274	0.222	0.116	0.311	1.054
J	—0 962	—0.713	—0.759	—0.485	−0 311	−0.348	—0.274	—0.274	(000)	0.080	0.166	0.274	0.625
A	—0 786	−0,786	—0.885	—0.739	−0.485	−0.259	—0.445	−0.222	—0.080	(.000)	0.025	—0.116	0.222
L	−1.476	—0.713	—0.625	—0.583	—0.856	—0 542	—0.502	−0.166	—0.166	−0.025	(.000)	.000	0.502
M	—1.293	—0.668	—0.806	−0 311	—1.117	—0.583	−0.311	—0.311	−0.274	0.116	.000	(.000)	0.111
G	−1.216	—1.216	—0 713	−1.216	−1.293	−1.080	—0.202	—1.054	—0.625	−0.222	−0.502	—0 111	(.000)
SUM	−11.188	−6.813	−4.141	−4 141	−1.956	−1.135	0.566	1.222	2.981	4.556	5.152	5.447	9.450
MEAN	− 0.861	−0.524	−0.318	−0.318	−0.150	−0.087	0.044	0.094	0.229	0.350	0.396	0.419	0.727
POSITIVE SCALE	0.00	0.34	0.54	0.54	0.71	0.77	0 91	0 96	1.09	1.21	1.26	1.28	1 59

gives undue weight to the power of verbal expression in which so many individual differences exist. But the complete abolition of the essay-type tests is not favoured by various commissions and committees as they have been found to be indispensable instruments for assessing abilities like the application of knowledge, organization and integration of thought and knowledge, and power of expression. Hence, we have to devise some ways and means to improve essay-type tests so that their element of subjectivity can be considerably reduced and they become a valid and reliable measures of educational achievement. In the present study both the groups of university teachers and students are of the opinion that the essay-type tests should be supplemented by the objective-type test items in order to increase their objectivity, reliability and validity. It is remarkable that the researches by Cowles and Hubbard (1952), Singh (1970), Rao (1974), Gayen and others (1962),and Koul (1974 a) have also brought out that in order to reduce the element of subjectivity of the essay-type tests and encourage intelligent understanding among the examinees, objective-type tests of attainment should be widely introduced side by side.

Introducing the semester sytem of examination have also been given top priority by the groups of university teachers and students because of the advantages of the system experienced by them in the Himachal Pradesh University from which the samples for the present study were chosen. The semester signifies the division of the academic year into two parts and it also implies that courses are designed to cover one semester instead of a year, and that final examinations are held twice a year. The major advantage of the semester system would seem to lie in the fact that it allows for much greater flexibility as far as the content of the courses is concerned. A teaching faculty in a college or a university can usually offer a much greater variety of courses under the semester system than when courses are of one to two years' duration. With a large number of courses available, the number of students per course is reduced. Thus the students can be allowed wider choice to fit their own special needs and interests, and more individualized education results. Finaly, the semester offers the possibility of a quantum increase in academic standards. For many students concentrating on fewer courses leads to more efficient study and learning. It is also well known that studends do most of their serious learning in three months before the final examination. If we have two final examinations in a year, and thus put two such three months period into the academic year, instead of one it is obvious that nearly twice as much can be learned. If a one year course is cut into two parts, a much more intensive coverage of each part is possible. The Education Commission (1966, pp. 278-279) has pointed out that the large gap between the standards in our country and those in the advanced countries is widening rapidly, and the first degree in India is little better than the high school level in such countries A committee of the experts appointed by the UGC for preparing a brochure outlining the principles and mechanics of the semester system has recommended that the effective use of the potentiality of the semester system could go a long way to narrow down the large gap between the standards in our country and those in advanced countries (Singh 1975).

The characteristic features of American semester system are grade system of marking and continuous periodical internal assessment. In the present study, too the innovations 'introducing the grade-system of ranking' and supplementing external examinations with periodical internal assesment', have clustered together in the top region of both the scales. But it may be noted that the semester system can work effectively and successfully if it is introduced without its concomitant parts While discussing the principles and mechanics of the semester system, Singh (1975) has also pointed out that

> A little reflection should bring the appreciation that it is a case of concomitance and not one of integral relationship. Internal evaluation and award of grades can certainly be introduced in universities with longer courses and widely spaced examinations with the same appropriateness as in those which my adopt the semester or trimester system. Likewise examinations can be completely ar partially external with numerical marks as at present even though course units be shorter and examinations more frequent There is nothing wrong in a wholesale borrowing from any system but the notion that all the components, essential and non-essential, must be together and if they do not, the system will be deprived of much of its usefulness is ill founded. Educational planning demands that all the variables in a particular situation be taken into consideration and the best that may be feasible be done. Between all and none several choices are open (p.14).

It goes without saying that all universities are not ideally suited to try out all that goes with semester system and so each university should decide for itself the pattern of semester system, keeping in view the student enrolment, level of instruction, nature of courses and the unitary or affiliating nature of university. Thus the grade system of ranking can be introduced quite independently in any system of examination because of its relative advantages over the existing numerical system of marking The relative ranking of students in terms of grades like 'outstanding', 'very good', 'poor' ; etc instead of percentile basis of awards on a 101-point scale may prove to be more exact, objective and scientific. The ranking on a 101-point scale seems to be unrealistic because it is very difficult to discriminate between the finer points on such a scale. Finer distinctions, as Anastasi (1968) has put it, are unrealistic and are likely to add only chance variance to judgments. The ill effects of numerical marking are legion and the system has done incalculable harm to innumerable students

It may be pointed out that both the groups of teachers and students have placed the innovation, 'making examinations completely internal', at the very bottom of their respective scales. This indicates that university teachers as well as students are not in favour of internalizing the examination system completely. There have been cases of partiality and some malpractices in the educational institutions where such an innovation was tried and experimented. The students feel that such a system may create an atomsphere of sycophancy and submissiveness. The teachers think that if the examination system is purely an internal affair, they will be evaluating only their own students and the question of comparison with others will not arise There can be persistent over-assessment of the candidates by the teachers for certain extra-academic considerations such as personal likes and dislikes, caste and community, payment of private tuition or through other forms of subterfuge. The evils of the present purely external examination system at different levels of instruction, which have been discussed in reports of several committees, commissions, are also well known to everybody Thus, after reviewing the defects of purely external as well as internal examination system, it would be worthwhile to devalue, to some extent, the external public examination by internalizing a part of the final assessment In the present study it is notable that the groups of university teachers and students have placed the innovation, 'supplementing external examinations with periodical internal assessment' in the top regions of both the scales. Secondary Education Commission (1953, pp. 120-121) and Education Commission (1966, pp. 246-248, 290-291) have also remarked that singly neither the external nor the internal examination can give a correct and complete picture of a student's all round progress at any particular stage of his education and so asystem of internal aseessment based on periodical evaluations, should be introduced as a supplement to external examination. But it has to be noted that the results of these internal assessments should not be mechanically added

to the external marks but kept separate and both should be shown side by side in the final certificate.

The innovation, 'defining the scope of questions in simple and clear language for making the task of the examinees well-defined and pinpointed' is also in the upper regions of both the scales, which indicates that both the groups give equal and quite a good deal of importance to this innovation. Most of the defects in the present essay-type tests are due to shortcomings in the questions and question papers set in the examination. Very few of the paper-setters possess the knowledge and skill necessary for the construction of valid and reliable tests. The study carried out by Gayen and others (1962) has also shown considerable defects in the framing of questions and question papers. The Education Commission (1966, p. 246) is also of the opinion that no major breakthrough towards improvement of examinations is possible unless the nature of questions asked is improved. On the basis of the results of an investigation (Singh 1970), conducted under the supervision of the author, it may be said that inter-examiner reliability of the essay-type tests can be increased significantly by making the task of examinees and examiners well-defined, which could be made possible by making the language of the question items more specific, precise, pinpointed and understandable to the examinees Moreover, the general instructions issued to the examinees in the form of 'note', etc. can be modified by instructing the examinees clearly not to write anything less or more than what has been asked in the question.

The only innovation, 'supplementing written examinations with oral tests', which has shifted in the upper region of teachers' scale has come down in the lower region of students' scale. This indicates that the views of university teachers and students differ with regard to the relative importance of this innovation. The students appear to have given a low importance to oral tests as a supplement to written examinations and on the other hand, the teachers have given quite a good deal of importance to this innovation. It seems that the opinion of university teachers is quite in agreement with the recommendation of the Education Commission (1966, p. 243) that there are "several important aspects of the student's growth that cannot be measured by written examinations, and other methods such as observation techniques, oral tests and practical examinations, have to be devised for collecting evidence for the purpose".

Coming down to the middle of the scales, we find that the innovations, 'orientation of paper-setters and evaluators' and 'making evaluation instructions precise and clear', are in the same region of both the scales, which means that university teachers and students give equal importance

to the measures which deal with the training of paper-setters and evaluators, and making evaluation instructions more or less objective. The orientation of paper-setters and evaluators in the form of seminars, workshops, inservice training and discussions is worthwhile to raise their technical competence. It would help the paper-setters to frame questions oriented to testing not nearly the acquisition of knowledge but the ability to apply knowledge and development of problem-solving abilities as pointed out by the Education Commission (1966, p. 246) also.

Consistency in the standard of evaluating and marking the answer-scripts can be increased by making 'general' and 'special' instructions, issued to the examiners, precise and clear. In some Boards of Secondary Education, the assistant examiners are called for a conference with the head examiners to decide on the marking scheme before the answer-scripts are evaluated. But in most of the Boards, as pointed out by Rao (1974), the head examiner issues instructions to assistant examiners. These instructions are very sketchy and are invariably received late by the assistant examiners. The Board of High School and Intermediate Education of Uttar Pradesh explicitly asks the examiners to go ahead with evaluation without waiting for the instructions. The exminers are required in this as well as in many other Boards to submit a sample of exmined answer-scripts to the head examiners. The whole procedure is drawn up in such a way as to give maximum freedom to the examiners to evaluate answers in their own ways. The system in the university examinations is even worse than this, as the universities seem to believe that what is being evaluated is some deceptive thing impossible of being put in in any order. In the absence of a definite scheme of evaluation, each examiner goes through some answer-scripts hurriedly, forms his own scheme, and starts giving marks. The candidates whose answer-scripts are evaluated first, must be luckless, individuals for many a time the examiners would be forced to whittle down his evaluation standards as he goes through the whole set of papers allotted to him. The procedure, as remarked by Rao (1974), has the build-in opportunity for large subjectivity and inter-examiner variability. The results of the investigations conducted by the Examination Research Unit of the Gauhati University (Misra 1968, Taylor 1963, Taylor, Tluanga and Misra 1966, Misra 1972) are applicable precisely to this situation. Examiners differed in the range of marks they had given, in numbers of answer-scripts awarded, different divisions and the numbers of failures declared by them. It was also found that the distributions of marks awarded by most of the examiners showed what was described as 'J-effect', i.e. a large number of scripts receiving exactly the pass marks.

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This may be due to the existence of strong social pressure on the unconscious mind of the examiners regarding failing of students. Another idiosyncrasy noted was the existence of 'persistence-effect'—the evaluation of a paper being effected by the impression the examiner had received from the immediately preceding papers. The Examination Research Unit has come out with the suggestions that the evaluation instructions should be precise and specified, that the answer-scripts be randomized before distribution among the examiners, and that the marks given by each examiner, be scaled to an average level representing the mean of all the examiners concerned.

It is also worthwhile that the examiners may either be asked to go through the whole lot of answer-scripts before their evaluation or they be asked to evaluate all answers to one question before proceeding to the next question. The special instructions can be made more detailed by bifurcating the questions into sub-questions, and specifying the weightage part-wise. For each sub-question, it is quite possible to prepare a brief model answer expected of the students. Some credits may be set apart for non-tangible aspects such as organizational ability, style, existence of critical thinking, etc. in certain subjects.

The four innovations, 'open-book examination system', 'using computers and mechanical devices in preparing award-rolls and compiling the results', 'scope for re-evaluation of answer-books', and 'spot-evaluation of answer-books', are in the lower region of both the scales. This indicates that the groups of university teachers and students do not attach much importance to these innovations. But as most of our teachers and students are unfamiliar with these innovations, it may be the reason that the two groups have placed them so low in the scale.

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Factorial Invariance

A Review of the Literature

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EDUCATIONAL RESEARCHERS who use factor analysis as a tool in their statistical analyses tend to treat their technique as a purely descriptive tool. This tool provides them with the characteristics (factor loadings) of the educational or psychological measurements they have utilized. Even though these educational researchers are considering their factor analysis as a statistical technique, factor theorists have been slow in applying the concepts and techniques of modern statistical inference to it. Factor analysts have a habit of treating these loadings in a purely descriptive manner; loadings greater than .30 are called "significant," those less than 20 are said to be "in the hyperplane"; and those between are treated tentatively, all independently of sample size. Following this same reasoning, if two groups are given the same battery and the tests are found to have different loadings, the interpretation is that the tests measure different traits in the two groups, even if the groups seem to approximate being samples from the same population. The viewpoint that factor analysis is performed solely to determine the loadings of tests on factors which characterize only the unique group of individuals that participated in the study is surely an invalid one. Theory and practice must take allowance for the fact that the investigator must be able to generalize from the sample data to a large universe of more or less equivalent data that might have been gathered. He must be able to generalize not only to a universe of tests but also to a population of persons.

Statistical Inference and Factor Analysis

Theoretical statistics has done relatively little toward providing factor analysis with the kinds of inference models most useful to it. This is largely a result of the complexity of the problem of dealing not only with multiple variables but also with the possibility of rotation to some criterion of simple structure, to say nothing of a criterion of meaningfulness.

The rigorously derived estimation procedures of Lawley (1940, 1953), Rao (1955) and Joreskog (1962, 1963, 1965) are notable examples. Provided the factors are estimated by the suggested methods, these authors have developed significant tests for the hypothesis that a given number of factors is necessary in order to account for the data. Bargman (1953) provides a statistical test of the hypothesis that a given set of the factor loadings possesses simple structure rather than being scattered haphazardly through the factor space. Joreskog (1965) provides a statistical test of the related hypothesis that the zero loadings defining a simple structure fall in specified places in the factor matrix.

Psychometric vs. Statistical Approach to Factor Analysis

The evidence concerning sampling fluctuations in factor analysis has always been considered from two points of view. First, the statistical, in which sampling fluctuations are the result of sampling of persons. This approach seeks to generalize from the data to a population of persons. Second, the psychometric, in which the resulting fluctuations are due to the indeterminancies in what is being measured. This approach attempts to generalize from the data at hand to a universe of measures.

Monte Carlo Methods

Where questions of practical interest have been too complex or too difficult to specify mathematically for analytical solution, the Monte Carlo approach is most appropriate. This procedure involves generating by some random process samples from some specified population. The relative frequency of result is tabulated in order to form the sampling distribution of a statistic which is of interest, but whose sampling distribution is too intractable mathematically to offer analytic solution. Sampling errors in factor analysis would appear to be appropriate for the Monte Carlo approach.

Sampling Error in Factor Analysis

A researcher who uses factor analysis should normally be concerned, at least implicitly with the size of the sampling fluctuations that he can expect for the factor loadings he is attempting to estimate. At the very least, he wants to know whether he can expect a radically different structure for the same variables if he obtains another sample from the same population. He is also concerned with the probability that a given loading is different from zero, i.e. whether or not it is significant in the usual statistical sense. The results in this area leave a large gap where the needs of the investigator are unsatisfied The statistical tests which are available, such as Lawley's (1940) and Rao's (1955), have to do with the number of factors rather than with the size of loadings. Except for Joreskog's test (1966) for the significance of the deviation from a hypothesized simple structure pattern, little exists in the way of procedures for coming to conclusions about the population size of a particular loading.

Review of Research

Previous research on factorial invariance has centred on :

1. indices of and criteria for factor matching, i e empirical apporach (Cattell 1949, Harmon 1960, Leyden 1953);
2. proving mathematically that a method of rotating factors exists, which will be invariant from study to study, i.e. theoretical approach (Ahmavaraa 1954); and
3. testing the sampling error of factor loadings (Spearman and Holzinger 1924, McNemar 1941)

Indices of and Criteria for Factor Matching

Harmon (1960) states that the measure of consistency of factors, for a fixed set of variables from sample to sample, would seem to be a classical problem in the theory of statistical sampling. However, little progress has been made toward the solution of the sampling problem.

Cattell (1949) suggests the use of the method of coincidence and of marker variables. He states that factors shall be considered matched or invariant when the most heavily loaded one-sixth of the variables in one factor has at least 50 per cent of items in common with the one-sixth of the variables that are most heavily loaded in the second factor.

Cattell and Baggaley (1960) proposed a non-metric parametric technique. This method uses marker variables and obtains an estimate of the probability of matching pairs of factors in two different studies.

Harmon (1960) proposes a simple root mean square formula for measuring agreement between corresponding factors weights. He also gives a formula for a coefficient of congruence to measure the congruence between pairs of factors in different studies. In addition, he states that these ideas were independently developed by Burt (1948), Wrigley and Neuhouse (1955), and Tucker (1951).

Leyden (1953) conducted an interesting study which points out great discrepancies in the results obtained by these different empirical methods. His study was reinforced by Pinneau and Neuhouse (1964), in which they also found large discrepancies in these methods However, they go one step further and suggest two new procedures for measuring invariance : (1) the coefficient of invariance for factor loading, and (2) the coefficient of factor similarity.

Patterson (1965) measured factorial invariance through the intercorrelations of factor loadings from different studies In his results he states that when a broad range of factors are intercorrelated, low correlation results However, when these factors are combined into two general factors, a large correlation is obained.

The Theoretical Approach

Some researchers feel the way to solve the problem of factorial invariance is by developing a better theoretical structure of factor analysis and of statistical sampling in factor analysis.

Ahmavaraa (1954) has done most of the recent "mathematical" work in factor invariance. He offers a mathematical proof of Thurstone's results and shows that simple structure is invariant under selections.

Werdelin (1962) developed a method of rotating the factors of a certain study to a pattern determined by the factors of another study. By applying this to two independent samples of data, he obtained a method of rotating a factorial solution to a structure given by his previous sample and a method of checking whether the two studies are congruent.

Meredith (1964) describes how an invariant factor pattern matrix exists that describes the regression of observed loadings on factor variables in different sub-populations. Also, this invariant factor pattern matrix is not unique.

Testing the Sampling Error of Factor Loadings

Spearman and Holzinger (1924), who had previously tested the sampling error of tetrad differences, were the first to study sampling errors of factor loading.

McNemar (1941) reported the first real empirical study on sampling fluctuation of centroid factor loadings. He conducted three empirical studies, the first based on available data on eight variables for 700 cases These were factored to three factors. In the second study the data was fictitious and provided 2,500 cases The last was based on real data for nine variables and 7,000 cases involving separate factorization for 35 samples of 200 cases.

These three studies agreed in showing that the sampling behaviour of first centroid factors was much like that of correlation coefficients; whereas the sampling fluctuation for loadings beyond the first were disturbingly large. McNemar's study was limited by the small number of variables used to define the factors and the lack of communality estimates which would result in slightly greater stability of the factor loadings.

To test the sampling error of factor loadings one would need a large number of repeated samples of data based on a test battery having the same factor composition In addition, one would need computer facilities for performing a large number of factor analyses

Employing large number of replications of batteries in dealing with empirical data has never been feasible. The major drawbacks with this method have been with matching the experimental variables underlying the hypothesized factor pattern, equating experimental samples from populations, and finally the formidability of the computations involved. The advent of large computers has alleviated these difficulties and made this type of study possible.

A potential source of factor invariance can be seen from an examination of the general linear model used in factor analysis. Each variable Z_j is considered to be a linear function of all common factors determined to be necessary from reduction of the order of a correlation matrix and a unique factor that supposedly does not enter into the correlations with other variables. This expression is given by

$$Z_j = a_{j1} F_1 + a_{j2} F_2 + \dots a_{jm} F_m + a_j U_j \qquad (1)$$

where $F_1, F_2, \dots + F_m$ represents the common factors, U_j is the unique component, and the coefficients, a_{jk} are the factor loadings or weights. The general assumptions made about these are that the factor scores have means of zero and unit variance The set of linear equations representing all variables is called a factor pattern. Harmon (1960) assumed that the common factors in a pattern may or may not be correlated, but that the unique components are uncorrelated with other unique factors and with other common factors.

Hamburger (1965) observed the sampling behaviour of the factor loadings of a pre-determined factor pattern. He also studied the relative amount of fluctuation from population values that occurred through direct and combined effects of the experimental conditions.

Bechtoldt (1961) used eight analyses of two sets of data to demonstrate the procedures and results of a confirmatory study with statistical tests of some, but not all, relevant hypotheses in an investigation of the invariance hypothesis. The empirical results provided estimates as substitutes for unavailable sampling formulations.

Cliff and Pennell (1967) employed the Monte Carlo approach in determining whether or not communality, factor strength, and loading size produce systematic effects on the sampling variability of individual factor loadings

The consequences of the sampling of persons must be examined and taken into account if factor analysis is to be a useful inferential tool. Many kinds of sampling errors exist in factor analysis corresponding to the various universes that may be sampled, as well as the variety of quantities (loadings, communalities, factor profiles, factor sizes, etc.) that may interest the investigator Monte Carlo studies of sampling errors in factor analysis have been relatively few.

Cliff and Hamburger (1967) present evidence concerning sampling fluctuations in factor analysis, with an emphasis on data gathered from Monte Carlo studies. This evidence is given concerning the influence of the type of factoring, size of loading, and method of factorings on factorial invariance. Their findings point out that the standard errors are somewhat smaller than $1/\sqrt{n}$, i e , the approximate standard error of a zero correlation. Hamburger's data are especially encouraging since he found that analytically rotated factor loadings are remarkably stable across samples.

A word of caution, however, since in his data not a question is raised as to the number of factors to rotate. Also, there are only four true factors and no small nuisance factors to muddy the picture.

Pennell (1968) utilized the Monte Carlo approach to demonstrate the dependence of factor loading sampling error on the communality of the test or variable on which the loading occurs. Also, the effect of an additional independent variable, N, the number of persons upon which each sampling is based, is studied. Pennell shows that increasing N, or communality, results in decreased sampling error of individual factor loadings, but for zero loadings, N has the greatest influence. Another interesting discovery is that distributions of factor loadings become relatively elongated as communality increases.

Rosenblatt (1969) uses the method of writing a linear model for a number of test scores to obtain repeated samples of scores containing the same factor composition. Each of a number of factor models generate samples which are factor analyzed. The stability of the factor loadings over the number of samples are then compared The limitation in his study is the use of principal component analysis and varimax rotation. With the newer rotational schemes this study is relatively outdated.

Summary and Conclusions

The study of sampling errors in factor analysis has traditionally been approached from two conceptualizations: the psychometric and the statistical. In the psychometric approach, the difficulties in estimating the factor loadings of the variables arise out of the sampling of the universe of variables and from the indeterminancies resulting from the possibility of rotation.

The statistical concept of factor analysis directs its attention to the estimation of factor loadings when the sampling is of persons. Here it is assumed that for any given set of tests there exists a population value for the matrix of factor loadings and that the problem is to estimate these population values from the sample data. The consequences of the sampling of persons must be examined and taken into account if factor analysis is to be a useful inferential tool

Many kinds of sampling errors exist in factor analysis corresponding to the various universes that may be sampled, as well as the variety of quantities (loadings, communalities, factor profiles, factor sizes, size of N, etc.) that the investigator may be interested in.

Monte Carlo studies of sampling errors in factor analysis have been relatively few and that these do exist have concentrated on the person-sampling approach. The reason for this seems fairly clear Here the universes are defined clearly enough to provide more or less straightforward means of generating random samples.

Hamburger (1965), Joreskog (1963), and Browne (1965) show that the sampling errors of single loadings are in the neighbourhood of $1/\sqrt{n}$

(at least for well-defined factors), much like the standard error of a correlation. These results indicate that the loadings in a sample matrix should differ from an hypothesis matrix only by $1/\sqrt{n}$ on the average if the sample is rotated to the hypothesis. However, the results are far from being either exact or extensive enough to warrant the routine reporting of "significance" levels in the literature.

All the above studies cited have dealt with factors that were uncorrelated in the population, although they may have rotated sample data obliquely Correlated factors may behave differently, so generalization of the statements concerning sampling characteristics of rotated loadings should be limited to the orthogonal case.

Joreskog's (1963) results indicate that under certain conditions sampling errors of unrotated loadings are likely to be so large as to render them useless as estimates of anything.

The influence of the number and size of the factors and the number of variables seem to require further explanation. The degree to which whole factors remain invariant across samples has not been studied from the person-sampling approach. It is worthy of study since the investigator is often more interested in this question than he is in single loadings.

Another limitation to the previous studies is the absence of the newer rotational method such as the Kaiser-Harris rotational procedure and the promax rotation.

Many aspects of factor invariance need to be studied. Some answers to the questions in this field are becoming available and, for the most part, they indicate that the purely statistical aspects of the problem of the stability of factor loadings are encouragingly small Now that the ground work has been laid and extremely high speed computers are available, future studies using the Monte Carlo approach should provide the information which will put factor analysis on a more firm statistical foundation.

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Learning through Seminars

An Experience

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This paper deals with seminar as a learning activity The author has described the mechanism of seminar and also reported about the reactions of seminarians to a series of 24 seminars The results indicate that the participants have found seminars as a useful method of learning. They have also offered suggetions for the improvement of this activity.

IN ANY INSTRUCTIONAL SITUATION, the learner continuously interacts with his environment which includes men and material This interaction aims at stimulating the mental activity of the learner to result in learning. Human interaction is markedly different from the interaction with material in terms of its potential to cause learning The main difference lies in the fact that in human interaction, the situation is continuously changing. This continuous change is primarily because of the involvement of human beings who have the capacity to react to any stimulus. The response made by an individual will act as stimulus for the other, thus generating a series of new stimuli This necessitates that the learner develop the ability to respond to ever-changing situations. Ability to respond in this manner would involve higher cognitive actions of a quick comprehension of the situation, examination of it against the knowledge he possesses and construction of his reaction to the situation. Unlike human interaction, the situations involving interaction with material are comparatively more static with regard to the presentation of the stimuli. And, thus, these situations will have less potential to develop the higher cognitive abilities as compared to the situations involving human interaction. As the development of higher cognitive abilities is essential at any stage of education, techniques involving human interaction will have a definite place in any instructional scheme. Several instructional techniques have been evolved with human interaction as underlying pedagogical principle, viz. a discussion, seminar, panel discussion, debate discussion, buzz session, brain-storming, role-playing, etc. Discussion in this paper is, however, confined to the technique of seminar.

Mechanism of Seminar

Seminar as an instructional technique involves creating a situation for a group to have guided interaction among themselves on a theme which is generally presented to the group by one or more members. The person who presents the theme should have studied the theme thoroughly beforehand. This would mean selection of relevant material and its organization. Generally, this organized material is put in the form of a paper which is circulated among members in advance The paper helps structure the theme, facilitates its communication, and focuses the scope for discussion. After the theme is presented, it is discussed by the group. During the discussion participants may (i) seek clarifications of the theme presented, (ii) make observations in the light of their knowledge and experience regarding the theme, and (iii) raise issues relating to the theme for further analysis and evaluation. Proceedings of the seminar will be guided by a chairman who may be knowledgeable about the theme The chairman's role would be to keep the discussion on track, stimulate maximum participation and consolidate at appropriate stages the viewpoints expressed. Seminar as an instructional technique seeks to provide maximally for interaction among the members. This means that sufficient time should be allowed for the discussion session ; if this necessitates cutting down the time for presentation, it could be done since the main purpose of the presentation is to initiate the discussion

The interaction in a seminar can be likened to the field of forces in mechanics. Different viewpoints or opinions expressed will represent forces in varied directions. However, unlike physical forces which when acting in opposite directions, at times, result in zero, the differing viewpoints or even opposite opinions will not result in neutrality but will induce further thinking among participants. It is this stimulation for further thinking that should be reckoned with significance as the net instructional value of the seminar. When there is an agreement of ideas among individual members, these may be considered as forces acting in the same direction and thereby having a reinforcing effect on the individual's view on the theme. In either cases the individual is benefitted as he is either led to further analysis and evaluation of his viewpoints, or helped in validating and thus strengthening them.

From the above analysis of the basic mechanism of interaction in seminar, it may be inferred that the seminar as an instructional technique has the potential to develop several abilities in students. Due to the process stimulation of thinking brought about through interaction, different higher cognitive abilities like, analytical and critical thinking, synthesizing and evaluating the ideas will tend to be developed. Apart from these cognitive abilities, certain affect attributes like tolerance for other's views, openness to ideas, cooperation with others, emotional stability and respect for others' feelings will be inculcated among the participants during the course of such sessions. These affect attributes represent the norms of behaviour for the group in the seminar situations. Moreover, these norms are the same as those of a democratic society. Deliberate efforts to adhere to these norms would of necessity be made during the course of seminar discussions. The adherence-to these group norms would gradually inculcate the affect attributes in the participants.

Concomitant effect of seminar as instructional technique will be the development of better learning habits. While preparing for presentation and participating in the discussion, learners will get induced to pursue independent study, engage in post-seminar discussions covering the themes discussed as well as related ones, develop a critical outlook to any idea thereby leading the learner to self-initiated learning which will be more permanent in nature

As can be seen from the above, seminar has great instructional value as it makes the instruction learner-centred and provides for learning through enquiry which is based on a very natural characteristic of inquisitiveness in humans. This natural way of learning through seminar establishes an important place for this technique at all level of instruction. From the practice, however, one may notice that it is mainly confined to higher education. Such a situation seems to have arisen mainly from the presumptions that the technique demands maturity in terms of language, social and emotional makeup and the facility to deal with abstractions. Since the students at lower levels of education do not possess the maturity to this extent, it is generally considered that seminar is less feasible to be adopted as an instructional technique at these levels. Such a demarcation of feasibility regarding the use of seminar stems from the rigid notion about the nature of themes to be discussed therein. It is generally considered that the seminar should have an abstract theme to be presented and discussed. Although there is nothing against the suitability of such themes for seminars, confining seminars only to cover these is more of historicity of the technique rather than its demands about the nature of the themes In fact the value of seminar should be seen in terms of the basic mechanism of the involvement of learners. Here the learners are expected to present to others their ideas or experiences who would react to them in the light of their own experiences. And, it is this interaction on the ideas or experiences, however high or low, concrete or abstract they may be in nature, that should be aimed at through this technique. Seeing seminar in this perspective, it may be quite feasible to utilize this technique effectively even at lower levels of instruction. At these levels the themes for seminar could be even simple and concrete experiences which could be narrated to fellow children who in turn could discuss them in the light of their own. Interaction on such themes also would involve behaviours like questioning, making observations, evaluating the theme by comparing it with their own experiences, etc., on the part of learners, which are characteristics of seminars The present paper, however, discusses experiences gained through the organization of weekly seminars for research students over a period of three semesters at the Centre of Advanced Study in Educaction, M. S University of Baroda

Background

Organization of seminars at the Centre has been a feature of its academic programmes since its inception in 1964. However, these seminars did not have a fixed structure in terms of frequency, duration, student involvement, etc to the extent that this programme could be institutionalized. With the liberalization of registration rules for the Ph.D. in Education at the Centre in the year 1973 with a view to encouraging interdisciplinary approach to educational research, even candidates from different disciplines who did not have degrees in education were admitted. By then the Centre had established itself as a national centre for educational research with adequate academic facilities The liberal policy of admission, which is not the case with most universities even today and the special status the Centre had acquired brought a considerable increase in the number of Ph.D. students coming from all over the country and a few from abroad. With this increased number of research students with varied backgrounds, it was a felt need to institutionalize the feature of seminars and to utilize it for providing a forum for free interaction on educational problems whereby participants may gain from the scrutiny of these problems through different viewpoints. It was thus decided to hold weekly seminars on a regular basis from June 1976.

Organization

Two senior staff members were made responsible for organizing the seminars. These conveners informally discussed with colleagues and research students to plan out the framework of the seminar series. The framework evolved is given below :

1. The seminar may be conducted every Tuesday. The choice of the day was made in view of the schedule of work at the Faculty.
2. The duration of these seminars was two hours to allow sufficient time for discussion.
3. The presentation of papers may be made by staff members and research students.
4. Students may present their research work at any stage of its progress. For presentation on other topics of their interest, they could take another chance.
5. The papers for presentation will be duplicated and distributed in advance.
6. Proceedings of each seminar will be conducted by a chairman from amongst particpants.
7. Each student gets an opportunity to present.
8. All research students have an obligation to attend seminars.
9. Seminars may be open to all those interested.

With this framework 25 seminars were conducted during the two semesters of the year 1976-77. Details of these seminars are given in the Table.

A few details regarding the mechanics of the organization of the seminar series may be mentioned to clarify further its functioning. Through informal sessions with the research students and the staff members, the conveners tried to persuade them to make presentations in the series. In case of research students it was mainly through encouragement if they happened to mention about their studies or other educational problems, and also in helping them in the preparation of papers for presentation. Senior members of the faculty were especially requested to present papers and participate in the seminars. This was done in order to create a supportive social climate regarding this academic programme in the faculty. The participants were assured by the conveners of the freedom to express their opinion and offer constructive suggestions regarding the organizational aspects of the seminars to make them more effective. Conveners also arranged for the systematic recording of the proceedings of each

TABLE

SEMINARS HELD DURING TWO SEMESTERS 1976-77

Area	*Total No of Seminars*	*Presented by*		*Team**	*Head*	*Chairman*		*Head*
		Research Fellows	*Staff*			*Research Fellows*	*Staff*	
1 Teaching Technology	5	4	—	1	—	1	3	1
2. Teacher Education	4	—	2	1	1	—	1	3
3. Sociological Studies	4	2	1	1	—	—	—	4
4. Innovations	2	1	1	—	—	—	1	1
5. Higher Education	3	3	—	—	—	1	1	1
6. Psychological Studies	2	2	—	—	—	1	1	—
7. Miscellaneous	5	1	3	—	1	—	2	3
Total	25	13	7	3	2	3	9	13

*Of the three team presentations one was by two research fellows and the remaining two were by one staff member and one research fellow each

Note : Tuesday seminars remained suspended in the event of any other seminar organized by the Centre or outside agency, or if Tuesday happened to be a holiday.

seminar to observe the extent of participation and thereby attempt to maximize participation through informal discussions. Further, it was decided to place on record in the library at the Centre, a copy of any paper presented under this series for future reference.

At the end of the academic year during which 25 seminars were held, an evaluation of this series was made to get opinions of the participants with regard to the benefits derived from the series, and also suggestions for improving academic and organizational aspects of this programme. For this purpose, an evaluation tool was developed by the authors. The tool consisted of multiple-choice as well as open-ended items regarding different aspects of the series. A few items referred only to research students while others were responded to by both research students and staff members Twenty-two research students and eleven staff members responded to the questionnaire Responses were analysed in terms of percentages for various responses. Content analysis was carried out wherever needed.

Evaluation Results

Of the research students who presented their projects, 90 per cent stated that they benefitted through this experience in terms of getting a greater insight into their research problems, and confidence in making presentations before others. Through the presentations made by others, to which research fellows and staff members responded, there was an expression of benefit regarding conceptual understanding of other areas and the methodology used therein and a positive influence on their ways of presentations through an exposure to other styles of presentations. Team presentations were generally considered useful as they provided better scope to examine the problems from various viewpoints. A large majority (88 per cent) of respondents opined that presentations ought to be made both by research fellows and staff and not be restricted to any one category mainly because the former could benefit throgh the richness of experience and depth of knowledge of the latter. Regarding the mode of presentation, the most popular view could be made during presentation rather than reading the paper or not consulting it during the presentation. One item regarding presentation to which only research fellows were to respond was regarding the stage of work at which one would like to present a seminar paper. A good number of respondents (50 per cent) opined that this could be done at each main stage of the research work However, a small number maintained that they would like to present their papers at the end of the research work. Perhaps this reflects that proper attitude towards the benefits to be derived to improve one's own research problem through interaction with fellow researchers has not been developed in them.

With regard to the topics of presentation, all respondents were of the opinion that varied topics should be presented. Research methodology was the most preferred area for future presentation of seminars. All but one of the respondents were in favour of having presentations by experts from related disciplines.

Participation in seminars influenced the development of certain affect attributes in participants like openness to others' ideas, objective outlook, confidence and emotional stability. All respondents expressed that seminars improved their academic habits in that they were stimulated to post-seminar informal discussions which further led to reading more on topics discussed. Similarly, all respondents opined that the participation in seminars helped them develop their viewpoints on various issues.

Most respondents (48 per cent) preferred that a question be discussed immediately after it is raised by participants. A few (39 per cent), however, thought that a set of questions could be discussed intermittently. Very few preferred that all questions be raised first and then discussed together. For an effective seminar, the respondents defined the role of the chairman which would be to direct, summarize the discussions, redress, also increase participation and check unduly prolonged discussions on a particular point with the exception of two respondents, all others expressed that prior circulation of papers to be presented proved beneficial since it helped in acquainting oneself with what was to be presented and in stimulating thinking on the theme.

Sixty-four per cent of respondents stated that by acting as chairman, one developed skills to direct group activity and learned to integrate ideas and place them coherently. They opined further, that one developed a greater objectivity. With regard to chairing of seminars, 76 per cent of respondents expressed that it should alternate between research fellows and staff members. The reason stated for this choice was that it would generate a climate of fellowship in learning and would give to research students the benefit of experience. Only 6 per cent of the respondents thought that the Head of the institution should chair the seminar, while some (6 per cent) preferred to leave the choice of the chairman to the speaker.

The opinion of respondents was sharply divided with regard to the periodicity of the seminar. A majority of respondents (72 per cent) thought that a duration of hours was sufficient for these seminars. Eighty-two per cent of respondents felt that the time devoted to discussion was sufficient. These respondents felt that for certain topics, the time devoted was not enough. Two respondents, however, expressed the need to increase the duration of discussion for all the topics

Concluding Remarks

Effective organization of the weekly seminar series demanded continual informal interactions among the group members regarding various aspects of the seminar. These interactions were initiated by the conveners and utilized for generating a free and frank atmosphere in which most group members cooperated and shared responsibilities for the effective conduct of the seminars. Involvement of group members in different aspects of this programme, as a team with a common objective of its successful implementation accounted for its effectiveness. However, as is natural to any innovative process, certain difficulties arose while running this programme, viz. initial hesitation on the part of group members to present their work, misunderstandings created among certain members by remarks made during discussions, lack of emotional stability displayed by a few members, etc. Such difficulties were resolved through informal, persuasive interactions and by involving them to a greater extent in the programme. Further, involvement of the Head and the senior members of the staff helped to a great extent in creating seriousness in and prestige for the programme, and thereby helping enlist greater cooperation of group members which resulted in the institutionalization of this innovation.

While discussing various educational problems in the seminars, it was observed that certain aspects of those needed a thorough examination from theview points of other disciplines. This need was reflected in the responses of 97 per cent of participants who suggested in order of preference that experts from sociology, psychology, economics, statistics, philosophy and political science be invited to make presentations. This inter-disciplinary approach to educational research is all the more necessary at this Centre which has on its roll members from various disciplines, who are engaged in pursuing research studies in education. Considering the fact that educational research is of recent origin in the country and that a suitable methodology for tackling various problems is yet to be sharpened, greater involvement of experts from other disciplines would enrich the understanding for educational problems. This would lead to forming inter-disciplinary working teams to deal effectively with problems of educational research development.

Follow-up

In the light of experiences gained through conducting the seminar series over a period of two semesters and the evaluation done at the end, a few changes have been incorporated to make the seminar more effective.

In response to a popular demand for the discussion on topics of varied nature, another series of seminars has been instituted every Saturday. This series provides a forum for discussion of methodological concepts and issues in educational research. In all 12 Saturday seminars were held. In order to meet yet another demand of inviting experts from other disciplines, a special series of seminars was added to the existing Tuesday seminars and Saturday seminars. Four seminars by an expert in psychology were organized under this special series. To accommodate the convenience of experts from other disciplines, the series is flexible with regard to its periodicity and time schedule. Eleven experts from the disciplines of economics, sociology, management, science, statistics, communication, philosophy and psychology are scheduled to present seminars under this series subsequently.

It may be recalled that the respondents were highly in favour of team presentation especially through the argumentative approach as it seemed to them to have a greater potential to stimulate critical thinking. Two presentations were subsequently attempted with this approach. Favourable reactions of most participants substantiated the finding of the evaluation conducted earlier on this point.

It can be seen from the Table that more than half the seminars were chaired by the Head. The Head was specially invited to chair sessions in order to bring about seriousness and create prestige for this programme among group members to facilitate the institutionalization of this innovation This practice of making special efforts to involve the Head was deliberately not pursued in the subsequent semester as it was felt that the seminar series got intrinsic acceptability with the group members. To further develop initiative and involvement of members in this programme, the practice of formal weekly notification was discontinued. With sustained efforts by the group members, the seminar series has been institutionalized as an effective instructional technique to help research students develop attributes needed for accomplishing scientific tasks in the field of education. This is perceived not only by the research students of this Centre but also by the research students in others faculties of this university as evident from the fact that a number of them come, on their own, regularly and participate in the deliberations of the seminars. □

Assessment of Psychometric Invariance Across Sex Groups

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The present study examines the psychometric invariance (structural stability) of the WAIS sub-scales across the sex groups. One hundred male and 100 female subjects in the age range of 18-34 years were individually given all the eleven scales of WAIS and 13 marker variables in small groups. Using a computer programme, the raw scores of all the 24 variables were intercorrelated and factor analysed by the method of principal axes solutions which were further rotated to Varimax solutions, separately for males and females. The factors in both the groups were then interpreted and matched across the groups. The rps between patterns of factor loadings of the WAIS scale across groups revealed information, comprehension, digit span, vocabulary, and object assembly scales as psychometrically invariant and arithmetic, similarities, digit symbol, picture completion, block design, and picture arrangement as psychometrically non-invariant scales. The implications of the non-invariant scales were discussed in the light of test theories.

THE PRINCIPLES OF PSYCHOMETRIC INVARIANCE ASSESSMENT have been elaborately dealt in many recent studies (Aftanas 1971a, Puhan 1974, 1975a, 1975b, 1977a). Based on Guilford's (1948) model of test contents, these studies assume that a test measures as many behavioural domains as the number of contributing factors to its variance and measures to the extent indicative by the corresponding factor loadings. Keeping this in view, Aftanas (1971a) pointed out that psychometric invariance assessment consists of determining the degree to which the sources of variability associated with a measure are invariant under conditions or change—some such conditions being developmental, cultural and behavioural. Psychometric invariance, therefore, requires that the structural (factor loading) stability of a measuring instrument must be achieved across certain dimensions against which it is intended to be used (Puhan 1975a, 1975b). There could be many dimensions that are capable of inflicting changes in the structural aspect of a test. Broadly speaking, these dimensions may be developmental (age groups), behavioural (neurotic, normal groups etc), cultural (Indian, Canadian etc.), and sex (male and female)

Psychometric invariance assessment in developmental dimension has already been examined by Aftanas (1971b) and Puhan (1974, 1975a) Such assessments have also been worked out across cultural dimension (Puhan 1975b). All these assessments have suggested that psychometric invariance of many Wechsler Adult Intelligence Scales (Wechsler 1955) have never been achieved. In this connection, Puhan (1975a) has already cautioned that lack of psychometric invariance across any dimension may have serious implications to the meaning of the test Such a situation would indicate that the concerned test may be perceived differently by subjects belonging to different groups in that dimension (Puhan 1975a).

Like age and culture, sex is also an universal factor which is likely to induce changes into the meaning of the test However, no attempt has yet been made to examine psychometric invariance of tests across sex groups. The present study, therefore, intends to examine the requirements of psychometric invariance of a standard ability test (e g. WAIS sub-scales) across two sex groups

Method

Sample

A total of 200 subjects (i.e., 100 in each sex group) were tested for the present study One hundred and ninety subjects were drawn from the introductory psychology classes of the University of Manitoba who participated in the study as a part of their course requirements. The remaining ten subjects who belong to the female group were volunteers and participated in the study to get some general feed-back about their performance on various ability tests. All the subjects of the present study constituted the sample under another study (Puhan 1974) and were within the age range of 18-34 years They were all Canadian citizens or were living in Canada for at least ten years at the time of testing.

Description of the Variables

Main Variables : In the present study the WAIS sub-scales (Wechsler 1955) were labelled as main variables because their psychometric invariance requirements were under investigation. This test consists of Information (Inf.), Comprehension (Comp.), Arithmetic (Ar.), Similarities (Sim.), Digit Span (D. Sp.), Vocabulary (Voc.), Digit Symbol (D. Sy.), Picture Completion (PC), Block Design (BD), Picture Arrangement (PA), and Object

Assembly (OA) sub-scales. The contents and nature of these tests have been described by Matarazzo (1972) and Puhan (1974) in full detail.

Marker Variables : The basic methodological objective of the present study was to manipulate a factor analytic situation which would result in greater accountable variance (h^3_-) for each of the WAIS scales. For it is argued that the accountable variance may be raised to an appreciable level before psychometric invariance of any kind can be conclusively studied (Aftanas 1971a). One way to approach the problem of raising the accountable variance of any tests has already been suggested by Comrey (1973). He pointed out that inclusion of marker variable in factor analysis will mark different and new factors which would not have appeared otherwise. This has already been demonstrated in a recent study by Puhan (1977b). He found that the inclusion of marker variables increased the number of interpretable factors, which, in turn, contributed to the variance of a test, thus adding to the magnitude of its accountable variance. Since psychometric invariance assessment presupposes appreciable accountable variance of the tests under investigation, it was necessary to include a number of marker variables in the present study. Accordingly such marker variables were searched for and examined with regard to their suitability for inclusion in the present investigation. Finally, Verbal Reasoning (VR), Space Relations (SR), Clerical Speed and Accuracy (CSA), Language Usage-Spelling (LU-S), Language Usage-Grammar (LU-G), Numerical Ability (NA), Abstract Reasoning (AR), Mechanical Reasoning (MR) Scales of Differential Aptitude Tests (Bennett, Seashore, and Wesman 1966), Series (Ser.), Classification (Cl.), Matrices (Mat.), and Conditions (Con.) of Culture Fair Intelligence Tests (Cattell, and Cattell, 1959) and Advanced Progressive Matrices (PM-A) of Raven (1947) were selected as marker variables. Most of these scales are supposed to be factorially less complex—a condition that characterizes a variable as the best marker (Comrey 1973).

Procedure

All the subjects were tested on Wechsler Adult Intelligence Scale (Wechsler 1955), Differential Aptitude Tests (Bennett, Seashore and Wesman 1966), Culture Fair Intelligence Tests (Cattell and Cattell 1959) and Advanced Progressive Matrices (Raven 1947). Each subject of the present study had to go through four testing sessions out of which one was an individual session and rest three were group sessions consisting of 10-15 subjects. All tests were administered in strict accordance with the instructions provided by the respective test manuals. The other details of the testing procedure appear elsewhere (Puhan 1974, 1977b).

Preliminary Analyses

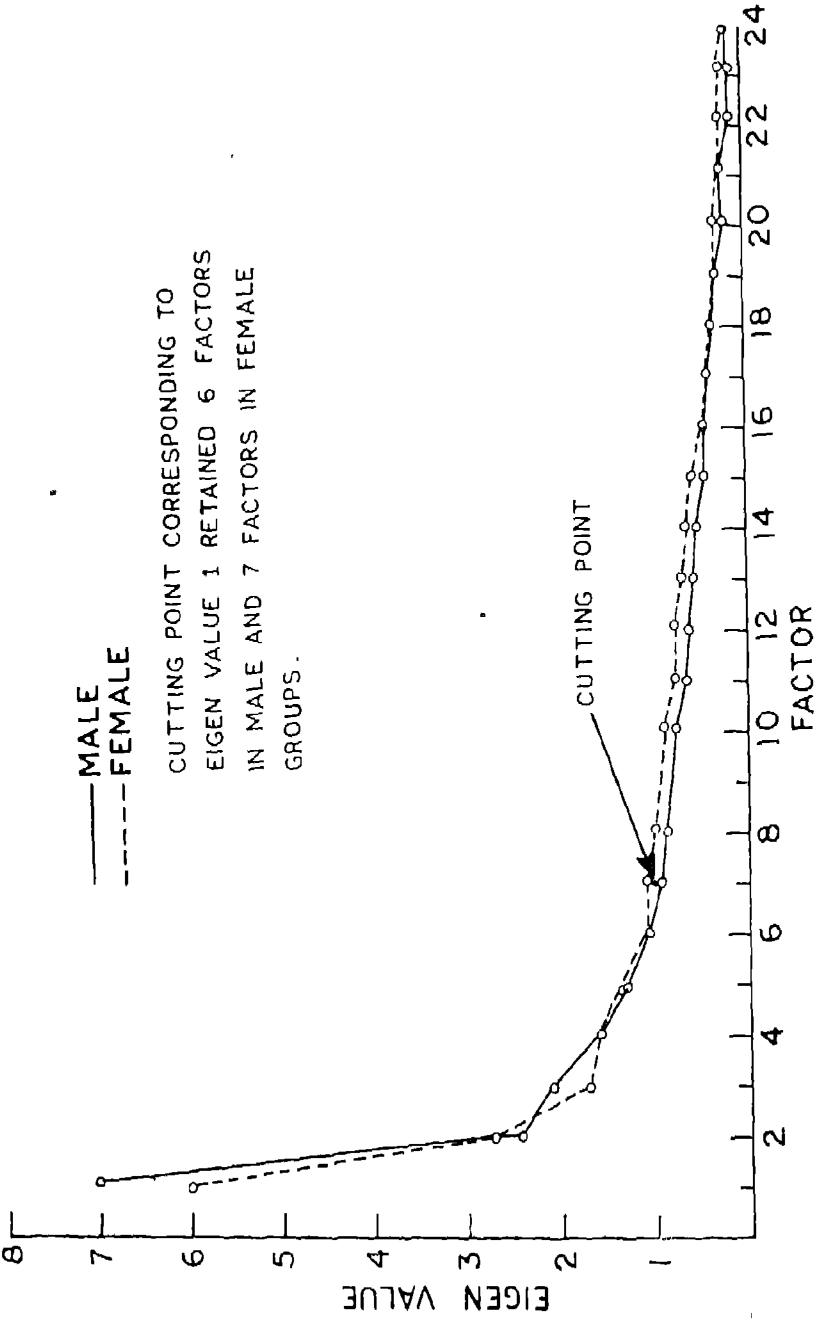
The analyses of the present study were based on the raw scores of the twenty-four variables and were performed on the IBM 360/65 computer at the University of Manitoba Computor Center. The programme which was used for the present study involves Pearson's Product Moment Correlation among all the variables It also involves a principal axes solution of the Correlation Matrix (Hotelling 1933). The programme further rotates the principal axes factors to an unique varimax analytic solution (Kaiser 1958). Two separate analyses were thus performed for the male and female groups.

Results

1. Factor Solutions

It could be recalled that the basic objective of the present study was to compare the factor structures of WAIS sub-scales across sex groups Such a comparison presupposes equal number of similar factors in both the groups. It was, therefore, necessary to examine the eigen values and select one from each of the groups that would result not only in equal number of similar principal component factors but also meet closely the criterion of "positive generalizability" (Kaiser and Caffrey 1965) and the 'scree test' (Cattell 1966). According to Kaiser and Caffrey an eigen value of 1.00 is arbitrarily considered a point corresponding to the criterion of positive generalizability. The scree test, on the other hand, involves plotting all the eigen values against the factors and selecting a point where the curve approaches a straight line which is recommended as a cutting point to retain factors Finally, eigen values of 1.00 and 0.90 were chosen for the factor analyses of the male and female groups, respectively. These two cutting points were most acceptable for the present investigation because they were in the neighbourhood of 1 00 (criterion of positive generalizability), met the criterion of scree test (see Fig. on page 58), and resulted in an equal number of similar principal component factors for both the groups, the last being a unique requirement in the present investigation.

SCREE TEST



CUTTING POINT CORRESPONDING TO EIGEN VALUE 1 RETAINED 6 FACTORS IN MALE AND 7 FACTORS IN FEMALE GROUPS.

The principal axes solutions were further rotated in accordance with the varimax criterion (Kaiser 1958) which approximates Thurstone's (1947) requirements of 'simple structure' and 'positive manifold'. The varimax rotation was chosen over other techniques because of the orthogonality (independence) among the resulting factors which is needed for matching the test's factor structures. These varimax solutions appear in Table 1 and Table 2 for the males and females, respectivety.

TABLE 1

VARIMAX FACTORS FOR MALE GROUP

Variables		*Factors*						
		I	*II*	*III*	*IV*	*V*	*VI*	*VII*
1	Inf.	004	—717	001	072	257	—108	121
2.	Comp	—064	—814	015	—021	—049	—108	—287
3	Arith	426	—095	255	020	330	—026	—584
4.	Voc	402	—634	080	142	008	—020	215
5	D Sp.	099	055	891	003	—036	085	—044
6.	Sim.	135	—701	068	—106	462	—083	—016
7.	D Sy.	106	122	—506	516	258	—310	—243
8.	PC	089	—150	825	120	058	—343	—056
9.	BD	413	—107	—179	—018	—026	—709	—226
10.	PA	140	—084	373	055	369	—504	—159
11.	OA	239	—096	096	—119	023	—736	287
12.	VR	575	—361	038	169	412	—210	031
13.	SR	664	—282	126	—118	—042	—417	—132
14.	CSA	035	—074	105	837	—003	073	028
15.	LU-S	—047	—165	—044	085	847	016	—106
16.	LU-G	430	—387	—009	—008	498	—143	140
17.	NA	531	—023	—127	441	269	146	118
18	AR	746	082	082	252	090	—305	—121
19.	MR	641	—340	091	—115	—012	—199	—188
20.	PM-A	606	—113	152	065	—029	—396	—043
21.	Ser	662	035	—061	—143	112	—108	081
22.	Cl.	402	—132	174	270	137	—352	357
23.	Mat	747	—008	178	289	—096	—030	—050
24.	Cond.	309	—343	120	216	—244	—257	—220

Note : Decimal points omitted.

2. *Interpretation of Factors*

Ordinarily, variables with factor loadings .30 and above are examined to identify factors (Harman 1970). However, such a figure may not always prove to be scientifically noteworthy while interpreting factors

TABLE 2

VARIMAX FACTORS FOR FEMALE GROUP

Variables		*Factors*						
		I	*II*	*III*	*IV*	*V*	*VI*	*VII*
1.	Inf.	224	—717	126	042	001	187	—020
2.	Comp.	—084	—675	—055	—247	—126	229	047
3	Arith.	237	—257	248	—010	396	208	—421
4.	Sim.	067	—473	—258	122	—018	238	080
5.	D Sp	—044	—060	—078	—001	857	057	073
6.	Voc.	—167	—801	029	—184	065	035	—252
7	D Sy.	079	—081	849	—022	—076	—137	—204
8.	PC	—011	—262	152	—702	—092	—096	023
9.	BD	141	—089	048	—220	144	533	—601
10	PA	101	—117	024	—126	082	804	—059
11.	OA	110	066	106	—663	171	342	—141
12.	VR	343	—632	—031	—338	221	—092	—115
13.	SR	384	—085	020	—578	231	201	—028
14.	CSA	020	049	823	—156	022	223	227
15.	LU-S	119	—629	166	193	107	—072	—011
16	LU-G	089	—683	—097	—205	106	—185	—275
17.	NA	850	—101	044	020	—029	125	—035
18.	AR	665	—209	025	—250	—053	—080	—069
19.	MR	143	—178	—187	—562	005	245	—415
20.	PM-A	583	—267	008	302	193	—035	—186
21.	Ser.	318	114	063	—497	005	—037	—188
22.	Cl.	686	183	039	—088	157	028	—299
23.	Mat.	280	—155	—020	—150	—037	—034	—757
24.	Cond.	365	—052	005	—236	514	064	—248

Note : Decimal points omitted

(Horn 1965). Therefore, in the present study, it was necessary to give greater weight to very high loading variables. A supplementary criterion was to examine the nature of tests with near zero loadings and reverse loadings particularly for interpretation of ambiguous and confusing factors or any factor which cannot be readily identified by the first criterion.

a. Male Group

FACTOR I. The variables with loadings above .30 on this factor are:

23.	Matrices	.747
18	Abstract Reasoning	.746
13.	Space Relations	664
21.	Series	.662

19.	Mechanical Reasoning	.641
20	Advanced Progressive Matrices	.606
12.	Verbal Reasoning	.575
17.	Numerical Ability	.531
16.	Language Usage-Grammar	.430
3.	Arithmetic	.426
9.	Block Design	.413
4.	Similarities	.402
22.	Classification	.402
24.	Conditions	309

This factor was interpreted as *abstract reasoning* The term 'reasoning' means here ability to work out a solution correctly on abstract level according to some defined principles; given or implied. The interpretation of this factor is based on the process involved in the high loading variables such as Matrices, Space Relations, Abstract Reasoning, Mechanical Reasoning, Verbal Reasoning, Block Design, etc. All these require subject to reason out the ultimate answer on abstract level

FACTOR II The variables with loadings above .30 on this factor are :

2.	Comprehension	—.814
1.	Information	— 717
6	Vocabulary	—.701
4	Similarities	—.634
16.	Language Usage-Grammar	—.387
12.	Verbal Reasoning	—.361
24.	Conditions	—.343
19.	Mechanical Reasoning	—.340

This factor was identified as *verbal reasoning.* The first six high loading variables are all verbal scales which need some sort of reasoning ability on the part of the subject The loading of two non-verbal variables (i.e. conditions and mechanical reasoning) are not sufficiently high to suggest this factor to be of a non-verbal nature. Rather the presence of these variables in the second factor could be attributed to their reasoning components which are evident in all other high loading variables. This factor has already been identified in many earlier studies (Cohen 1952, Puhan 1974).

FACTOR III. Four variables loaded significantly on this factor .

5	Digit Span	.891
8.	Picture Completion	.825

10.	Picture Arrangement	.373
7.	Digit Symbol	—.507

This factor was identified as a *freedom-from-distractibility* factor. The variables with high loadings on this factor are digit span and picture completion which indicate the presence of a memory or carefulness process. However, a high negative loading of digit symbol (which needs attention on the part of the subjects) suggests this factor to be more of a process of freedom-from-distractibility than just a process of memory. In the past such a factor has already been noticed by many investigators (Cohen 1952, Puhan 1974)

Factor IV. The following three variables are loaded significantly on this factor:

14.	Clerical Speed and Accuracy	.837
7.	Digit Symbol	.516
17.	Numerical Ability	.441

The fourth factor of the male group was identified as *perceptual speed* because scores on all the high loading variables of this factor are dependant on one's ability to perceive simple visual symbols and give proofs to that effect as quickly as possible.

Factor V. The following five variables loaded significantly on this factor:

15.	Language Usage-Spelling	.847
16.	Language Usage-Grammar	.498
6.	Vocabulary	.462
12.	Verbal Reasoning	412
3.	Arithmetic	.330

This factor was identified as a *language usage* factor. Of all the high loading variables, both the Spelling and Grammar of Language Usage scales contributed more than half to the total variance of this factor. The use of language (in this case English) is also indicative in Vocabulary, Verbal Reasoning, and Arithmetic scales. This factor has also been identified earlier (Puhan 1974).

Factor VI. The following variables loaded appreciably on the sixth factor:

11.	Object Assembly	—.736
9.	Block Design	—.709

10.	Picture Arrangement	—.504
13.	Space Relations	—.417
20.	Advanced Progressive Matrices	—.396
22.	Classification	—.352
8.	Picture Completion	—.343
7.	Digit Symbol	—.310
18.	Abstract Reasoning	—.305

This factor was interpreted as *perceptual organization* factor because all the high loading variables require organization of discrete parts of an object perceived earlier. This factor has been repeatedly noticed in many investigations in the past (Cohen 1957, Green and Berkowitch 1964).

FACTOR VII. Only two variables had significant loading on this factor :

3.	Arithmetic	—.584
22	Classification	—.357

It was not possible to interpret this factor.

b. *Female Group*

FACTOR I The high loading variables on this factor are the following :

17	Numerical Ability	.850
22.	Classification	.686
18.	Abstract Reasoning	.665
20.	Advanced Progressive Matrices	.583
13.	Space Relations	.384
24.	Conditions	.365
12.	Verbal Reasoning	.343

This factor was interpreted as *abstract reasoning* because variability in scores on all its high loading variables require one's ability to utilize reasoning on abstract level. The nature of this factor is same as the first factor of male group.

FACTOR II Seven variables had high loadings on the second factor :

6.	Vocabulary	—.801
1.	Information	—.717
16.	Language Usage-Grammar	—.683

2.	Comprehension	—.675
12.	Verbal Reasoning	—.632
15.	Language-Usage Spelling	—.629
4.	Similarities	—.473

This factor was identified as a *verbal reasoning* factor. The interpretation of this factor is based on the same rationale as in the second factor of male group which was also identified as a verbal reasoning factor.

FACTOR III. Only two variables loaded highly on the third factor :

7.	Digit Symbol	849
14.	Clerical Speed and Accuracy	.823

Like the fourth factor of male group, this factor was interpreted as *perceptual speed* factor

FACTOR IV Variables with high loadings on this factor are the following :

8.	Picture Completion	—.702
11.	Object Assembly	—.663
13.	Space Relations	—.578
19.	Mechanical Reasoning	—.562
21.	Series	— 497
12.	Verbal Reasoning	— 338
20.	Advanced Progressive Matrices	—.302

This factor was identified as *perceptual organization* factor. The nature of this factor is similar to the sixth factor of the male group.

FACTOR V The following three variables had appreciable loadings on this factor :

5.	Digit Span	.857
24.	Conditions	.514
3.	Arithmetic	.396

This factor was interpreted as *number memory*. It could be seen that scores on all the high loading variables on this factor are dependant on subject's memory of numbers and number relations. This factor may be matched with the freedom-from-distractibility factor of male group.

FACTOR VI The following variables loaded highly on this factor :

10.	Picture Arrangement	.804
9.	Block Design	.533
11.	Object Assembly	.342

This factor was indentified as *sequence perception.* Picture completion which contributes to more than half of the variance of this factor requires the ability to perceive sequence of an incident. This ability is also reflected partly while working out problems of Block Design and Object Assembly.

FACTOR VII. Following variables had high loadings on this factor .

23	Matrices	—.757
9.	Block Design	—.601
3.	Arithmetic	—.421
19.	Mechanical Reasoning	—.415

This seems to be a redundant factor of perceptual organization.

3. *Matching of Factors and Invariance Analyses*

It may be observed from the preceding section that no two factors of the male and female groups were fully indentical. After a close study of the nature of the factors, it was, however, possible to determine the most similar or approximately similar factors across the sex groups. A table showing factor similarities was, therefore, prepared to serve as reference for arrangements of factor loadings which was essential for subsequent invariance analyses.

TABLE 3

SIMILAR PAIRS OF FACTORS ACROSS MALE AND FEMALE GROUPS

New Order	*Original Order*	*Male*	*Original Order*	*Female*
I	(I)	Abstract Reasoning	(I)	Abstract Reasoning
II	(II)	Verbal Reasoning	(II)	Verbal Reasoning
III	(III)	Freedom-from-Distractibility	(V)	Number Memory
IV	(IV)	Perceptual Speed	(III)	Perceptual Speed
V	(V)	Language-Usage		————
VI	(VI)	Perceptual Organization	(IV)	Perceptual Organization
VIII		————	(VI)	Sequence Perception

Note : Language-Usage and Sequence Perception were unique factors for male and female groups, respectively.

Horn's (1961) corrected version of pattern correlation coefficient (r_p) was used to determine the similarities and differences between the factor loadings of WAIS scales across the sex groups. The basic assumption of this analysis is that the dimension (in the present context, the factors) be independent and scores of profiles have equal weights. The first assumption is implicit in orthogonal factors of the present study. The second assumption was approximated by converting all raw scores (in this case factor loadings) to standard scores. The results of the invariance analyses for all the WAIS scales appear in the eleventh column of Table 4.

TABLE 4

PATTERN CORRELATION COEFFICIENTS (r_p) OF FACTOR LOADING OF WAIS SCALES BETWEEN SEX GROUPS

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*
	Male	*Abstract Reasoning*	*Verbal Reasoning*	*Freedom-from-Distractibility*	*Perceptual Speed*	*Language Usage*	*Perceptual Organization*	*No Similar Factor*		
Variable	*Female*	*Abstract Reasoning*	*Verbal Reasoning*	*Number Memory*	*Perceptual Speed*	*No Similar Factor*	*Perceptual Organization*	*Sequence Perception*	h^2	*rp*
Inf.	Male	004	—717	001	072	257	—108	000	5967	69*
	Female	224	—717	001	126	000	042	187	6165	
Comp.	Male	—064	—814	015	—021	—049	—036	000	6707	71*
	Female	—084	—675	—126	—055	—000	—247	229	5948	
Arith.	Male	426	—095	255	020	330	—026	000		21
	Female	237	—257	396	248	000	—010	208	3837	
Sim.	Male	402	—634	080	142	008	—020	000	5904	35
	Female	067	—473	—018	—258	000	122	238	3663	
D Sp.	Male	099	055	891	003	—036	085	000	8150	95**
	Female	—044	—060	857	—078	000	—001	057	7491	
Voc.	Male	135	—701	068	—106	462	—083	000	7456	53*
	Female	—167	—801	065	029	000	—184	035	7094	
D Sy.	Male	106	122	—506	516	258	—310	000	7108	39
	Female	079	—081	—076	849	000	—022	—137	7583	

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*
PC	Male	089	—150	825	120	058	—343	000	8463	08
	Female	—011	—262	—092	152	000	—702	—096	6022	
BD	Male	413	—107	—179	—018	—026	—709	000	7174	13
	Female	141	—089	114	048	000	—220	533	3753	
PA	Male	140	—084	373	055	369	—504	000	5588	04
	Female	101	—117	082	024	000	—126	904	8640	
OA	Male	239	—096	096	—119	023	—736	000	6317	64*
	Female	110	066	171	106	000	—663	342	6132	

Note · (a) Decimal points omitted.

(b) The order of factors of the female group is consistent with that of the Table 3.

(c) Factor loadings were first converted to standard scores for which r_ps were computed.

* P < 05

** P < .01

The *rp* for Digit Span was positive and significant at .01 level. The *rps* of Information, Comprehension, Vocabulary and Object Assembly were also positive and significant at .05 level. The rest of the *rps* were found to be insignificant.

Discussion

It is intersting to note that most of the marker variables of the present study did in fact prove to be good markers in that they helped the emergence of many new factors. For example, language usage in the male group, sequence perception in the female group and abstract reasoning in both were clear products of marker variables included in the present study. Such a situation would indicate that present study was more or less successful in tapping a greater percentage of variability sources of the WAIS sub-scales through forcing the emergence of new factors and strengthening the basic factors of WAIS. This is also evident from high communality estimates for most of the WAIS scales (Table 4).

The seventh factor in the male group was uninterpretable. This left six factors in each of the groups. However, all these factors could not be adequately matched across the groups because language usage in male and sequence perception in female groups were group-specific factors (Table 3). Therefore, zero entries were made against these group-specific factors in the other group for the purpose of invariance analyses (Table 4). Matching of rest of the factors of the groups were not much of a problem since each factor of the male group had a counterpart in the female group.

The *rps* of Information, Comperhension, Digit Span, Vocabulary and Object Assembly Scales were found to be significant at .05 level which proved these scales as psychometrically invariant In other words, these scales measured same behavioural domains of factors across sex groups and, therefore, could be used to test males and females without any reservations. On the other hand, the *rps* of Arithmetic, Similarities, Digit Symbol, Picture Completion, Block Design, and Picture Arrangements were all found to be insignificant, Such a situation indicated that these scales lack psychometric invariance requirements across the sex groups. It may also be pointed out that the scales lacking psychometric invariance in the present study can no longer be considered dependable in terms of what factors the measure in males and females. For example, freedom-from-distractibility factor in male group contributed 64 per cent to the variability of picture completion scale whereas perceptual organization factor in the female group contributed 49 per cent to the variability of same scale. Reversely speaking, picture completion test predominantly measured freedom-from-distractibility factor in male group whereas it measured predominantly a perceptul organization factor in the female group. For these differential implications, the tests which were found to be lacking the requirements of psychometric invariance may be used by investigators as long as they know and interpret as to what these scores mean across sex groups.

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Developing an Academic Motivation Inventory

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Much has been embarked on achievement motivation but very little has been done on academic motivation Adaption of foreign tests of this type has not been much fruitful in the prediction of academic achievement Therefore, the author of this paper has made an effort to develop an academic motivation inventory for the first time in India. This inventory has been developed on the basis of three factors, namely, academic aspiration, study habits and attitude towards school.

MOTIVATION PLAYS an important role in the development of economic growth as well as in the academic achievement. Much has been embarked and done on achievement motivation (Edward 1954, Gough 1957, Barnette 1961, Mitchell 1961, Alport and Haber 1960, Argyle and Rabinson 1962, Alexender and Husk 1962, Mysers 1962, Buxton 1968, Costello 1967, Costellog 1968, Entwistle 1968, Khan 1969, Russell 1969, Lymm 1969, Entwistle and Entwistle 1970). However, there is not a single tool developed in India to measure academic motivation of secondary school students. Psychological Wing of Patna University has adapted the Aberdeen Academic Motivation Inventory under Indian conditions but it has many weaknesses. Despite that a number of inventories on academic motivation have already been published, the majority of them are not suitable for use with the adolescent pupils of Indian secondary schools However, Aberdeen Academic Motivation Inventory was adapted to Indian conditions by Patna University, but due to certain shortcomings the investigator thought it a fruitful exercise to construct his own tool for measuring academic motivation. The investigator followed the procedure used by Buxton.

Nature of Academic Motivation

One of the problems about academic motivation is that of the concept and its measurement. The concept of academic motivation has been borrowed from two sources. The first is the basis of factorial study of the Personal Value Inventory (1962) published by Finger and Schelleser (1965) The second source of the concept of academic motivation is the definition of academic motivation given by Entwistle and Entwistle. Entwistle defines academic motivation as one's determination to succeed in academic studies Finger and Schlleser have discovered three dimensions or factors of academic motivation · (i) Aspiration for scholarly future, (ii) Attitude towards school, and (iii) Study habits. On the basis of these three dimensions plus the views of Entwistle and Entwistle, the investigator constructed and standardized the aforesaid test.

The following steps generally followed for the construction of attitude scale (Lickert, Crobnach, Anstasi, Edward), were followed in developing academic motivation inventory. This was done to facilitate graded responses instead of dichotomous responses like 'yes' or 'no'.

1. Assembling a large number of items, considered to be relevant to the variable to be measured, namely (i) Academic aspiration, (ii) Study habits, (iii) Attitude towards school.
2. Pre-Try-out : Administering these items to a group of 40 students in order to find out the difficulties in understanding the language and other concepts.
3. Again, after eliminating and modifying few items which show little difficulty in understanding and elimination of those items which show little discrimination power in relation to high and low scores.

Collection of Items

The objective was to develop a questionnaire pertaining to academic aspiration, study habits and attitude towards school. Each question was expected to be checked by the respondent in terms of the degree of agreement or disagreement on a five-point scale The responses could later be converted into quantitative scores. The summation of the score assigned to all the items of the scale gives an index of the pattern and quality of the academic motivation of a pupil. An important step was to collect major areas of academic aspiration, study habits, and attitude towards the school. Suitable items contributing to a particular area were constructed. The collection of the items was mainly done from the pupils and teachers. In three schools, students of Class X in the age range of 15 to 17 years were asked to write few sentences or few points about the following :

(i) Methods of study followed by them.
(ii) Obstructions to study
(iii) What do they do to get good grades.
(iv) Environmental factors, which motivate them.
(v) Likings and dislikings about the school and teachers, which motivate or discourage them in getting good grades.

Eight teachers from four secondary and higher secondary schools of Jaipur and Tonk were requested to furnish few sentences or statements describing the most common way of motivating students, the common study practices and the physical conditions which provide hinderances in getting inspiration for observing academic accomplishment.

Another important source for the collection of the items was to make use of the items from the available scale. But the main handicap in using these items was that many of the academic motivation tests were standardized under the social culture and educational background of the Western countries, had items that might not work well under Indian conditions of living. In the light of these facts, a few items had to be entirely changed, a few reworded, and others had to be slightly modified. The available scales consulted for this purpose were mainly the following :

1. G. E Schlesser and J. A. Finger. *Personal values inventory.* Hamilton, New York Colgate University Press, 1972
2. N.J Entwistle. Academic motivation and school attainment. *British Journal of Educational Psychology*, Vol. 58, Part 2, pp. 181-187, June 1968
3. Ivan L. Russell. *Motivation for school achievement. Measurement and validation*, Vol. 62, No. 6, Feb., 1969
4. William F. Brown, Wayne. H. Haltzman. A study attitude questionnaire for predicting academic success. *Journal of Educational Psychology*, Vol. 46, pp. 75-84 1955
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of Academic Success. *Educational and Psychology Meaurement.* Vol. 14, pp. 726-732, 1954.

The list of items collected from various sources were then combined and compared with the characteristics of motivation and academic motivation.

Finally, 80 items (40 negative and 40 positive) were selected and they were grouped under three categories : (i) Academic aspiration, (ii) Study habits, and (iii) Attitude towards school. It should be noted that these categories were the three dimensions of academic motivation.

Before collecting the items of the academic motivation inventory, the investigator could get the weightage to each variable by 10 experts in the field of Education and Psychology. The average weightage assigned to each dimension is presented in Table 1.

TABLE 1

WEIGHTAGE ASSIGNED TO EACH DIMENSION

S No.	*Dimension*	*Weightage Assigned*
1.	Academic aspiration	38%
2.	Study habits	35%
3.	Attitude towards school	27%

Item Selection

The next phase consisted in determining the relevancy of a particular item to the academic motivation inventory to be measured and to reduce considerably the number of items to form a small but efficient scale. The items were thoroughly screened and edited. The items which seemed to overlap with one another were critically examined. Either one item conveying the idea most clearly was retained or the language of an item was changed to make it suitable to express the same. Several criteria were formulated and followed in the selection and editing of the statements ·

1 The statement should be clear, short and simple.
2. The statement should have just one meaning
3. The statement should contain one complete thought.
4. The statement should pertain directly to the variable under consideration.

5. The statement should encompass the characteristics of motivation and achievement motivations.

Considering the above criteria a total of 80 items were retained. The scale developed was a five-point scale, having five categories of responses, namely 'strongly agree', 'agree', 'indifferent', 'disagree', and 'strongly disagree'. It was decided to include both positive and negative items in the scale, so that an agreement with an item would not indicate in all cases only one end of the dimension. This would help us to avoid halo effect. Thus, there were 40 positive and 40 negative items.

Pre-try-out

After editing the statement it was pre-tried-out on 40 students. Lindquist points out that a pre-try-out is "the preliminary administration of the tentative try-out units to small sample of examinees for the purpose of discovering gross deficiencies but with no intention of analysing pre-try-out data for individual item". Thus, the investigator administered this questionnaire to know the deficiencies of the questionnaire and the difficulties of the students in answering the questions. Minor changes in languages and sentence-construction in some of the items were made. Five items, which were not marked by any of the students were deleted from the questionnaire.

Again, this questionnaire containing 75 items was sent to 25 experts in the field of education in order to judge the suitability of the items. Out of 75 itmes 9 items were rejected by 75 per cent of the experts and thus these nine items were excluded from the questionnaire.

Try-out

Instructions for administration and scoring procedure were finalized. This questionnare was administered in six randomly selected schools of Bharatpur, Tonk and Ganganagar. Three of them were secondary schools and the other three schools were higher secondary schools. The schools were selected in such a way that every schools represented the heterogeneity of the population in respect of socio-economic status. It was presumed that the SES affects academic motivation. This questionnaire was administered to a sample of 300 students of Class X. Out of 300 students, only 185 answer-scripts were selected for item analysis. Books on educational statistics have discussed about 40 different methods of item-analysis Some are highly restricted in their applicability, others can be used almost universally. In fact the variation in the items validity data from sample to sample is generally greater than that among the different method. For this reason, the choice of the method is often based upon the amount of the labour required and availability of the special computation devices. Keeping in mind the time, labour and energy the investigator applied chi-square test for item discrimination. Twenty-seven per cent upper and 27 per cent lower cases were selected for item-analysis. According to Kelley the optimum point for two conditions, sharpness of differentiation and reliability of the statistics is reached when upper 27 per cent of the sample is compared with lower 27 per cent.

Again, in order to sharpen the scale, the investigator also used the *t*-test for item analysis on the basis of the formula proposed by Edward. Table 2 presents the discriminating powers of the items.

The investigator selected only those items which could show discrimination in the obtained scores of high achievers and low achievers at .05 level in both the tests. This procedure ensured that items which did not discriminate between pupil with high and low total scores, were removed Thus, sensitizing the questionnaire, a total of eight items were discarded. Thus the final questionnaire contained 58 statements for endorsement, each of a five-point scale Out of these 58 items, 29 items were positive and 29 were negative. A detailed analysis of the items is given in Table 3.

Reliability of the Test

The split-half reliability in the present case could not be worked out. The form of the test is such that its two equivalent halves could not be obtained. The test has three parts, to obtain the split-half reliability, each part needed to be split into two halves. Moreover, even if each part of the test was mathematically put up into two equivalent halves, the two halves would psychologically be not equal and each part would have lost its significance.

Naturally, efforts were made to collect data which would yield the test-retest reliability. One of the great drawbacks with test-retest method of calculating reliability is that the psychological function under study, sometimes, changes in the interval under retest. By the time the second testing takes place the changes in the trait of the subjects under study take place and the results change. Then the factor of memory may also play its part. The scores of the subject may change in the second test because of earlier practice with such items Then, probably, practice may produce vary-

TABLE 2

DISCRIMINATING VALUE OF THE ITEMS OF ACADEMIC MOTIVATION INVENTORY WITH THE HELP OF CHI-SQUARE AND T-TEST

Item	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
χ^2	17.73**	37.20**	41.90**	28 66**	15 25**	3 69^{R}	7 25^{R}	27 35**	41 56**	25.12**
t	7.5**	7 42**	5.78**	3**	2.70**	.29^{R}	.4^{R}	4.70**	6.17**	4.5**
Item	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
χ^2	35 56**	46 44**	29.56**	39 96**	40.54**	30 76**	42.82**	2.38^{R}	18.50**	13 08**
t	9.1**	4.6**	4.05**	4.9**	5.41**	5.70**	7.35**	1.00^{R}	2.28^{R}	2 94**
Item	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*
χ^2	25.58**	23.32**	17.30**	2 20^{R}	18 28**	3 18^{R}	16.66**	37.08**	8 60^{R}	46 90**
t	3 28**	7.1**	3.76**	1 4^{R}	3.35**	.47^{R}	8**	7 00**	1.60^{R}	7.07**
Item	*31*	*32*	*33*	*34*	*35*	*36*	*37*	*38*	*39*	*40*
χ^2	36.40**	19.72**	6.68^{R}	5.82^{R}	43 58**	21.76**	11 00*	17 50**	10.50*	39 06**
t	8 5**	4.58**	1.70^{R}	0^{R}	7 41**	11.64**	3 58**	6.14**	11.5**	6 4 **
Item	*41*	*42*	*43*	*44*	*45*	*46*	*47*	*48*	*49*	*50*
χ^2	56 00**	43 90**	35 68**	42 08**	27 04**	45 06**	21 34**	54 16*	29 12**	67.20**
t	6.47**	4.42**	4.43**	6.35**	6 64**	6 35**	5**	6**	5.21**	11.14**
Item	*51*	*52*	*53*	*54*	*55*	*56*	*57*	*58*	*59*	*60*
χ^2	55.04**	29.34**	69.30**	18 80**	28.74**	28 74**	14.96**	55 96**	23.96*	63.36**
t	17.07**	5.28**	5.85**	4.76**	10 0**	4 21**	10 02**	9 59**	5.41**	3.5*
Item	*61*	*62*	*63*	*64*	*65*	*66*				
χ^2	36.04*	47 26**	45 44**	39.68**	55.84*	18.28**				
t	4.45**	6.88**	7.78**	7.33**	9 29**	4.02**				

**Significant at .01 level

*Significant at .05 level

R . Indicates the rejections of the items

TABLE 3

DETAILED ANALYSIS OF THE ACADEMIC MOTIVATION INVENTORY

S No	*Dimensions*	*Weightage assigned to each dimension*	*Number of items included in try-out form*	*Number of items selected for final form*
1	Academic aspiration	38	24	22
2	Study habits	35	22	20
3.	Attitude towards school	27	20	16
		100	66	58

ing amounts of improvements in the retest scores of different subjects. It would be worthwhile to see as to how the above objections are related to the present case.

The psychological function under study in the present case, academic motivation, is not likely to undergo a change during such a short period of four to six months. The period of four to six months is sufficiently long to discount the operation of the factor of memory. The items in the present test are not such that they can be influenced by the factor of interest or rapid change in the SES or attitude towards the school or study habits The practice with such items is also not expected to make an appreciable change in the expression of academic motivation by the subjects at the time of second testing Under the circumstances it was thought advisable and psychologically sound to use test-retest method to determine the reliability of the tool.

The sample for the study of reliability was drawn from three institutions of the city of Jaipur and Ajmer. The institutions were Adarsh Vidya Mandir Higher Secondary School, Jaipur, Subodh Jain Secondary School, Jaipur and Rajendra Secondary School, Ajmer. From the point of view of socio-economic status of the parents, whose children study in these institutions, the institutions stand at three levels, high, medium and low in terms of academic standards. The Adarsh Vidya Mandir, roughly speaking, stands at high, the Subodh Jain Secondary School at the medium and the Rajendra Secondary School at the low level. The socio-economic status of the parents had to be taken into account, as academic motivation is that psychological entity which is highly susceptible to SES factor. The test-retest correlation coefficients were calculated on data obtained over one and three months' interval These were found to be 0.89 and 0.83, respectively Again, the product moment correlation for three areas of the academic motivation worked out to be as shown in Table 4

TABLE 4

TEST-RETEST RELIABILITY OF THE ACADEMIC MOTIVATION INVENTORY : N=100

Category	*Coefficients of correlations after one month*	*Coefficients of correlations after three months*
Academic motivation	.89	.83
Academic aspiration	.86	.87
Study habits	.84	.81
Attitude towards school	92	.89

Validity

Validity of a test is usually difficult to determine and specially so in the case of academic motivation. Strong argues that his inventory (interest) is valid because of the manner in which it has been constructed. The above argument, more or less, applies to the present case as well. The present academic motivation inventory, in its format, employs the areas of academic motivation derived by Finger and Schlesser. Items have been prepared on the logical basis to measure each area of academic motivation in the light of the definition given by Finger and Schlesser and Entwistle. Attempts have been made to sample each area of academic motivation as systematically and fully as possible by items as formulated above. The test, thus, can be said to possess logical validity or validity by definition which is another name for content validity.

Besides content validity, a number of different measures were made to assess the validity of the questionnaire. First of all, coefficients of correlation were calculated between scores on inventory and grades at the end of annual examination marks totalled for all the school subjects. The correlation between grades and scores on academic motivation questionnaire has been presented in Table 5. Next, teachers' estimates of academic motivation of these pupils (rating on a five-point scale) were collected, pooled, and correlated with the scores on academic motivation Again, the validity of the test was judged on the basis of CR test. Fifty such students were selected who secured first division in the secondary class and 50 who secured third division. These students were given academic motivation inventory. The CR was calculated and it was found that the difference between the two groups was significant beyond .01 level. Again, the validity of this test was established against the criterion of Aberdeen academic motivation inventory. The coefficient of correlation woked out to be 0.49 which is significant at .01 level.

In order to judge whether the academic motivation inventory has any relationship with need achievement motivation, the investigator validated the academic motivation inventory against the scores of need of achievement of the EPPS test. The investigator could get significant correlation between these two measures. The obtained correlation was .29. The inference can be drawn that this inventory possesses some major characteristics of achievement motivation. Though the obtained coefficient of correlation is low yet significant. The cause of the low correlations is due to the narrow range of scores of need achievement. These results are shown in Table 4

TABLE 5

VALIDITY COEFFICIENTS OF CORRELATION BETWEEN ACADEMIC MOTIVATION INVENTORY AND DIFFERENT MEASURES : N=100

S No	*Name of the external criteria against which validity has been established*	*Validity coefficient and value of C.R*	*Level of significance*
1.	Grades of Class X	.27	01
2.	Teacher's rating (Two teachers rated each student)	21	.05
3	Aberdeen Academic Motivation Inventoiy (Indian adaption)	49	01
4	Scores of need achievement on EPPS	,.29	01
5.	Fifty first divisioners and 50 third divisioners were compared	7.65	01 & above

Taking all these data into account, it can be safely said that the inventory was reasonably reliable and valid.

Test of Skewness and Kurtosis

TABLE 6

TEST OF SKEWNESS AND KURTOSIS OF THE TEST OF ACADEMIC MOTIVATION : N=1500

Mean	*Median*	*S.D.*	*Skewness*	*Kurtosis*
216.56	218.37	27 14	—.06	.306

The above analysis indicates that the distribution of the scores on the test of academic motivation is very near to the normal distribution. These data can be used as norm in terms of sigma distance.

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Ph. D. Theses Abstracts

High School Examination, Aptitude and Teachers' Estimate as Predictors of Achievement in Science at the Intermediate Level

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THE EXPLOSION OF POPULATION together with the explosion of knowledge has posed new challenges to all of us. The present task for the teacher is to educate the child for effective manpower utilization to check prevalent wastage and stagnation in the society. This problem implies the idea of guidance which involves two very clear phenomena—classification and selection. The work of an expert is to classify the job or vocation on the one hand and individuals on the other, based on their own biological endowment. Diversified curricula has posed a specific problem to select optional subject at the secondary stage. A wrong choice can mar the career of a student and make him a misfit as well as a problem for society. Here a skillful and judicious guide and reliable instrument of guidance can come to rescue.

The entire process of guidance is concentrated in discovering the abilities and aptitudes of the child. The marked role of science and technology in the development of human society has given it a high place In our schools rush for science courses is increasing day by day as science education reaps considerable social appreciation added with wide scope of employment. Lack of direction and unwise selection of educational opportunities create a great wastage of human energy. The trial-and-error method leads to wrong choices and waste of efforts, because low ability combined with high ambition frequently leads to low scoring, inefficiency and frustration. Thus, in a country like India, careful guidance has become a must for every child coming to school.

Large number of consistent failures in public examinations, very low

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*Thesis submitted to the University of Gorakhpur (1973)

**The publication of Ph.D. theses abstracts is financed by the Indian Council for Social Science Research, New Delhi percentage of creativity out of huge population studying science are alarming One of the main reasons for this wastage and disappointment is the lack of proper guidance for selection and classification at the beginning of the course. A scientific approach for acceptable guidance work would converge to preparation and use of an aptitude battery of tests for science in order to predict the success of students at intermediate examination in science.

Aptitude is a very early concept in the history of human thought. Aptitude is an absract noun indicating a quality or a characteristic of a person. Drever (1953) regarded it simply as a natural ability to acquire relatively general or special type of knowledge or skill. Scientific aptitude is the application of general intellectual capacity to scientific materials and problems. The factor-analysis approach to the scientific aptitude by many workers, viz. Powley (1937), Ellis (1948), Berridge (1948), Young (1949), Khan (1951), Jog (1955) and Peel (1955) show that a group factor for scientific study does not exist. However, works on aptitude testing have successfully been attempted by workers abroad and in India To name a few in the field of science aptitude test of work on prediction of achievement in engineering, medicine or vocational counselling ; Scientific Aptitude Test (Zyve 1929), Differential Aptitude Test (1947), General Aptitude Test Battery (1947), Flanagan Aptitude, Classification Tests (1953), Predictive Battery for Differential Scholastic Aptitude (Varma 1955), Predictive Battery of Tests for Aptitude for Science (Deshpande 1967) and Aptitude Tests developed by National Council of Educational Research and Training to be used for National Science Talent Search Scheme may be mentioned here for study.

The present work involved construction and administration of an aptitude test for science to have relevant data and figures. In the second order statistical analysis of the data was used as tool of measurement to predict the success. Multiple regression method of prediction was applied. For the purpose of criterion, marks obtained in physics and chemistry at the intermediate examination were chosen, as these are common to both groups, i.e. biology and mathematics. 'Discriminant function', a problem in regression with a dichotomous criterion, has been employed to discriminate the two popular categories in the science stream, viz., biology and mathematics Customarily, high school examination marks alone are taken to be the most suitable predictor of success in the forthcoming examination. The two predictors, namely, teachers' estimate and the aptitude test in addition to the high school marks were evaluated by the method called 'pooling square' (Spearman 1913).

The first step in the development of an aptitude battery of tests was the job analysis representing the activities and behaviour that are carried out in scientific work and the circumstances under which they are performed. The elements of science aptitude on the basis of investigators' own experience and insight along with expert's opinion in addition to the information available by previous studies. To begin with, an opinionnaire was sent to science teachers in secondary schools, teachers' training departments and universities. Finally, eight abilities, crystallized out of the long list, were accepted as the predictors of aptitude in science for the present work. The eight abilities constituted the eight separate components of the battery. The tests were named after these abilities, viz. (i) Manual Dexterity, (ii) Cause-Effect Relationship, (iii) Special Perception, (iv) Problem Solving, (v) Reasoning, (vi) Observation, (vii) Number, (viii) Memory. Items for these eight selected functions were constructed to prepare the preliminary draft of the tests. The language of the test is Hindi in Nagri script.

The tests were administered in August-September 1970 to a sample of 433 students of Class XI science group, randomly drawn from the recognized Intermediate Colleges in Azamgarh, Ballia, Deoria, Gorakhpur and Varanasi districts of Uttar Pradesh. In order to have fair cross-section students from rural and urban, government and private colleges, biology and mathematics group and of the both sex, male and female, were included in the sample. After scoring the answer-sheets computation of the index of item difficulty (Δ) and an index of validity (r) or discrimination was done for each item Satisfactory items were sorted out to be included in the final draft of the tests of the battery. The final draft of the tests were prepared afresh and administered to 443 science students of biology and mathematics group in Class XII during November-December 1971. The purpose of the final administration was to develop the test parameters of reliability and validity. The criteria for selecting the final sample were the same as for the tryout stage. Some new institutions were included in the sample. Students who had taken up the test at the tryout stage were not selected for final testing

The gross scores were condensed and statistical values of the eight tests were calculated to make the distribution range meaningful and comparable to fit in a normal curve. The obtained results were compared with those to be expected, by the process followed in chi-square and curves were drawn. It shows closeness to normal distribution which reflects satisfactory working of the tests of the battery and argues well for discriminative power of the test at the level of scientific aptitude for the success at the intermediate stage.

To judge the efficiency of the test, measures of reliability and validity were calculated, reliability (r_{tt}) of each test was found by Kuder-Richardson (1939) method. The composite reliability (r_{ss}) of the battery was calculated to be 0.85 (Mosier 1943). The test 'problem solving' was eliminated as statistically it did not show significant contribution to the multiple R of the battery. Hence, only seven tests were taken into account while calculating reliability of the battery. Wherry-Doolittle test selection method was applied to combine test in the battery. The multiple-regression equation was developed by setting up constant multipliers, i.e. regression weights to have the composite score for each individual. The equation was extended to include the correlation of each test with the criterion, to obtain a multiple R equal to .4876 (or 49). The regression equation, thus evolved, gives the score for selection of pupils for science group on the basis of test predicting score obtained by it Variance ratio was calculated (Johnson 1950) to test the significance of multiple R which was found to be $P > 01$. The regression equation in score form is given below :

$$x_0 = 1.7\,C + .418 + 1.54\,R + 1.940 + .47\,N + .84\,M - .13X - 2.88$$

In order to find out the difference between the two groups (biology and mathematics) on the potentiality level, Fischer's technique called the discriminant function was employed. Two limits for the contrasted groups were set up and for a new case, 'U' was calculated. Exceeding the 'U' the student goes to the second group, falling below it he stays in the first. In the present study the test of significance between the two groups as referred to F-table was found to be $p > .01$.

The objective of the study was to select personnel on the basis of the composite test score, the mean of the population was taken to be the reference point and out of the differences between individuals the three divisions—first, second and third—assigned in the examination were accounted as the basis for standard. The normal practice for predicting a criterion performance is the regression of criterion score on test score (Gullikson 1949). In the Indian situation, first, second and third division success require 60, 45 and 33 per cent marks, respectively. In this case a conservative view was taken namely, encouraging the above-average to hope for relatively better results and the poor performers not to opt for further course. In the peculiar Indian situation, however, the regression of test score on a criterion should be employed (Varma 1971) In the present work reverse regression of score on criterion, expressed in standard score form was calculated.

The work was concerned with the problem of selection and classification of potential candidates to science streams at intermediate level. Further, the object of the researcher was to help the students to understand their mental functions and opt for either of the two groups, viz., biology and mathematics The statistical values of the test parameters show that the battery is dependable and safe to apply for selection and classification at the beginning of intermediate course (post-high-school stage) to science career aspirants. The F-ratio qualifies the battery significant beyond .01 level.

□

Construction and Standardization of a Non-Verbal Group Test of Abstract Reasoning

VEENA ANAND

INTELLIGENCE is an innate capacity of the individual. According to Binet, intelligence means the capacity "to judge well, to understand well, to reason well". Some psychologists like Buckingham, Groden, etc have defined intelligence in terms of learning. All these approaches emphasize on different attributes of intelligence. Spearman's theory, known as two-factor theory, has narrated two factors, 'g' and 'h'. 'G' factor operates in any activity to the degree to which the task demands discovery of relations and education of correlates while the other factor is specific to a particular kind of problem or activity Thurstone, Thomson and Guilford do not agree with him. They believe in multiple or group factors in intellectual abilities.

Mental tests are used for identifying emotionally instable and feeble minded persons. Intelligence tests are also used for placement and rehabilitation of the physically handicapped. They are also used in the field of child guidance.

The present test is a test of abstract reasoning, the ability closely connected with general intelligence. The investigator proposed the following guidelines for construction of the test :

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*Thesis submitted to Banaras Hindu University (1975)

1. Four or five alternative answers be given to reduce the influence of guessing.
2. One of the answers should be definitely correct and others should be plausible, although incorrect
3. All the alternative answers should be equal in size.
4. Distractors may be similar in form to the correct answer, or slightly less precise or complete than the correct answer.
5. Only such choices be given as might seem possible.
6. Correct responses should appear in random orders within the choices.
7. The problem stated in the lead must have a definite answer.
8. Irrelevant clues to the correct answer should be avoided.

The test items are geometrical figures and are of series, classification, progressive matrices, and complete-the-pattern type. The test has four parts. Part I consists of items of series type. In this part on the left side there are five squares with the last square a blank one; on the other right side five answers are given and the subject has to select one square which completes the series on the left side of the page. Part II has items of classification type in which four out of five squares have geometrical figures with one blank square. The subject has to select one from five designs given on the right side of the page to complete the pattern. Pattern-type items are given in part III. Most of the designs in this part are symmetrical and the missing portion is outlined with a square of $\frac{1}{2}'' \times \frac{1}{2}''$ in size. The respondent has to select the missing portion out of five alternatives given against the items. Items of Part IV are based on the pattern of Raven's progressive matrices. The whole process of reasoning, e.g. analysis, discrimination and synthesis is involved in these items. Every pattern has a missing part One has to discriminate and select which alternative completes the pattern.

There were 200 items in the test when it was administered for the pilot study. The test did not have any time-limit and the sample used for item-analysis consisted of 300 cases. Subjects in the age range 20-30 years, consisted of students, engineers, clerks, teachers, nurses, housewives, businessmen, etc. The maximum and minimum difficulty values of the items were worked out which are given on the next page.

Parts	*I*	*II*	*III*	*IV*
Number of items	50	50	50	50
Maximum difficulty value	.93	.91	.90	.90
Minimum difficulty value	12	.23	.32	.11

For calculating phi-coefficient, which is a common measure of correlational statistics in item-analysis; 'upper' and 'lower' groups by taking 25 per cent cases in each of the two extreme groups, were taken. Only two items (22nd and 25th of Part 1) had negative phi-coefficient values. The final draft had 100 items, 25 items in each part. these items were rearranged in the ascending order of their difficulty values.

For the determination of the time-limit, fresh round of testing wae undertaken with the instruction to the subjects to work as fast as they could and it was fixed at 60 minutes. After that the test was administered for the second time on 75 respondents. The result was a mean score of 70.75 and SD 20.60. Since the mean score was too high, for the next round the time-limit was reduced to 50 minutes (N=75). This time the mean score was 56.16 and SD 24.85. The result showed that the test was still easy and so it was again administered with the time-limit as 35 minutes. The results are as follows:

Time	Mean	Mdn.	Mode	S D.	Sk	Ku
35 min.	51 10	51.20	51.40	18.90	.015	.291

Before accepting the time-limit finally, the investigator tested the goodness of fit by using the chi-square test. The chi-square value was 5.17 for df 6 which is statistically not significant.

The final draft of the test was administered to a sample of 1,187 adults. The test of homogeneity was tried on groups of men and women with different educational attainments. Norms were prepared separately for three groups, viz. postgraduate and graduate men, postgraduate and graduate women and intermediate and matriculate men and women.

Reliability coefficients obtained by different methods are given below :

Methods	*Men*	*Women*	*Combined*
Test-retest	.920	.871	.892
Split-half technique (S.B. formula)	.969	.943	.967
Flanagan's formula	.898	.746	.850
Rational equivalence	.951	915	.941

Standard error of measurement and index of reliability are as follows :

	Men	*Women*	*Combined*
Standard error of measurement	±4.53	±4.58	±4.60
Index of reliability	.98	.97	.98

The findings on variables like, level of education, sex, rural and urban population and vocations are given below:

1. The scores showed a progressive rise with the increasing level of education with both men and women. However, postgraduates and graduates make a homogeneous group while intermediates and matriculates constitute another homogeneous group.
2. Men scored higher than women though there was no significant difference among matriculate and intermediate respondents. Men scored significantly higher than women among the graduates and the postgraduates.
3. Urban subjects scored higher than rural subjects. This the investigator has attributed to the environmental stimulation provided by their respective areas.
4. Significant differences were found among groups of different vocations. Engineers scored the highest and agriculturists scored the least. These groups have the least measures of dispersion of scores.
5. Working women and housewives make a homogeneous group and do not show any significant difference.

(Abstract : Neerja Shukla)

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A Critical Investigation into the Practice of Student Teaching and Evaluation Programmes in Training Colleges of Andhra Pradesh

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THERE is a persistent demand from all parts of the world for improving the quality of education. The quality of education depends to a large extent upon the quality and efficiency of the teachers. Increasing the efficiency of the teachers is the responsibility of teacher education. Unless the quality of teacher education is improved, it is rather difficult to improve the quality of education. Hence, development of teaching skill is a primary function of teacher training institutions. Teaching practice contributes to the development of teaching skills. That is why teacher educators have given a high priority to student teaching.

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*Thesis submitted to M S. University, Baroda (1977)

While pointing out some major weaknesses in teacher education, Kothari Commission (1964-66) stated.

> The quality of training institutions remains, with a few exceptions, either mediocre or poor, competent staff are not attracted; vitality and realism are lacking in the curriculum and programmes of work which continue to be largely traditional and set patterns and rigid techniques are followed in Practice Teaching with disregard for present day needs and objectives.

Importance of Student Teaching

Theory without practice is meaningless. A Teacher must get opportunities to come into contact with children and understand their individual differences, their needs, their problems and solve them by applying the principles and methods he has learnt. Thus teaching practice becomes an integral part of teacher education In order to develop efficiency and skill in teaching, pupil-teacher must get all sorts of laboratory experiences of the activites which he has to perform as a teacher. This can be achieved through effective organization of student teaching.

Organization and Evaluation of Student Teaching

The colleges of education under the three universities of Osmania, Andhra and Sri Venkateswara in Andhra Pradesh are having student teaching programme in the B. Ed. course. When the investigator participated in some of the professional conferences of teachers and teacher-educators, he noticed a certain amount of dissatisfaction among the teachers over the deficiencies in teaching which have been traced to the defective student teaching programme organized by the colleges of education. Some of the researches also revealed certain drawbacks of the student teaching programme in vogue.

Therefore, it is a matter for investigation to know that the pattern of organization of student teaching including pre-student teaching period, teaching period, the supervision, guidance, the feedback innovations carried out, and finally, the evaluation aspect of student teaching.

The Present Study

The present study was taken up in order to make a thorough investigation into the various aspects of student teaching in the three university areas of Andhra Pradesh in relation to the established theory of student teaching. This investigation is confined to all the colleges of education in Andhra Pradesh under the jurisdiction of the three universities, Osmania, Andhra, and Sri Venkateswara, which are serving the three regions of the State, Telangana, Andhra and Rayalaseema, respectively. The study is delimited to the field experiences, provided in school situations to student-teachers as distinguished from the theoretical instruction provided on the campuses of the colleges of education.

This investigation being handled by a single researcher, in conformity with the requirements of the doctoral course of university, could not be conducted in a sophisticated manner due to heavy expenditure on field experiments or investigations. Hence suitable methodology of research has been adopted to find out the truth about student teaching on scientific lines.

Objectives

1. To find out the priority of perception of the personnel involved in the objectives of student teaching.
2. To study the organization and method of evaluation of the student teaching
3 To identify the difficulties and problems faced by the teacher education personnel.
4. To analyse the problems and make suitable recommendations to solve the same taking into consideration the various suggestions made by the personnel directing the student teaching.

Methodology

A detailed plan of work which is employed during the course of investigation is given below:

Nature of the data collected

(a) Systems of student teaching
(b) Organization of student teaching
(c) Evaluation and feedback,

Method adpoted

Survey method is adpoted to collect the data

Techniques followed

(a) Mail-questionnaire technique
(b) Interview
(c) On-the-spot study.

Tools used

(a) Questionnaire
(b) Interview
(c) Observation schedule.

Documents studied

(a) The syllabi of the three universities of Andhra Pradesh : Osmania, Andhra and Sri Venkateswara
(b) Lesson plans in different subjects
(c) Proformas for assessment, observation and criticism
(d) Reports of cooperating teachers.

Population and Sample

All the principals of colleges of education in the State, college teaching staff, heads of cooperating schools, cooperating teachers and a sample of student-teachers formed the population for this study.

Major Findings

On the basis of the analysis and the interpretation of the data obtained the following conclusions are revealed on the various aspects of student teaching.

1. The pattern of organization and method of evaluation are found to be more or less identical, even though they differ in certain minute details in the B Ed programme as in vogue in the three universities of Andhra Pradesh.

2. The principals, lecturers, student-teachers, all have almost the same opinion about the priority of the objectives of student teaching.

3. The three universities have not fixed any period or duration for student teaching, but they have fixed 10 or 15 lessons in each method to be completed during the course.

4. The student teaching is arranged two days in a week in the cooperating schools till they complete the prescribed lesson. Blackboard practice teaching, intensive teaching practice, internship is arranged for a period of two to four weeks.

5. Before the commencement of student teaching all colleges arrange demonstration lessons and observation lessons. Guidance is given in lesson planning, blackboard practice and in preparation of teaching aids.

6. Majority of colleges of education are not having model or practising high school and they are depending on 15 to 25 surrounding schools for student teaching Cooperating schools are reluctant to allow the student-teachers to their schools for this purpose. Some colleges are providing incentives to the cooperating teachers for their supervision. Only a few colleges are arranging a conference of cooperating school staff before the commencement of student teaching.

7. Supervision is found to be based on a cooperative approach. Almost all the colleges are depending on the cooperating school teacher for the superivision of lessons. Sometimes methods masters, other staff members of the college and even tutors supervise the lessons. Supervisors are writing remarks on a given proforma or on the lesson-notes itself for the feedback purpose. Only on a few occasions post-lesson discussions are taking place during student teaching period. Lessons are ill-supervised, and sometimes unsupervised when two or three lessons are arranged in one period and for one supervisor. Very few innovations have been introduced in the colleges.

8. Criteria of assessment are found to be different in the three universities. Subjectivity and impressionistic aspects are finding place in the evaluation. The form of assessment is also found different in the allotment of marks to each aspect of the student teaching. Weightage of marks are also found different in the total schemes of examination for the student teaching. Records of evidence of evaluation are found almost the same in all the three universities.

9. Sufficient qualified staff is not provided to the colleges of education. Cooperating schools are providing cooperation unwillingly. Student-teachers and staff are taking the programme as easy and are not serious about it. There are not attached high schools for laboratory experiences in student teaching. Student teaching is taken as a formality and ritual just for fulfilling syllabus prescription, but not in an effective manner to realize its full spirit as outlined in the objectives of student teaching.

This idea is supported more by the interview data than the questionnaire's data. In the syllabi we find fine descriptions of student teaching and other field laboratory experiences expected to be conducted by the colleges of education. But the teacher-educators and student-teachers confess that the practical work is taken only as necessary prerequisite to appear for the theory examination and same has not been taken seriously.

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Organizational Climate, Teacher Morale and School Quality

KOTHAI, PILLAI

QUALITY EDUCATION, the cry of the modern age, is determined by the quality of schools and in turn school teachers. The structural characteristics comprising human relations between the school community, administration, etc. also play an important part in this direction. In a way it is the institutional environment which reflects in a big way the quality of education imparted in a particular school, besides their willingness to innovate, and attitude and behaviour of the faculty among themselves. Individual personalities and job requirements interact to produce a climate that can be significant to both the individual and the organization. Institutional climate varies from institution to institution depending upon the attitude of the staff and the relation between the institutional faculty and the administration.

Objectives

The major question taken up by the study was 'whether and how far differences in climate are related to the achievement levels of pupils'. The main objective of the study was to investigate if there are some organizational climates which lead to better teaching-learning process in schools than others. If so, what are the possible climate alternatives and which of these alternatives would be more valuable to administrators for improving the quality of schools. The second important objective of the study was to find out whether high morale among the faculty members of the school influences innovative ability of the school and the performance level of the students.

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*Thesis submitted to M.S. University, Baroda (1973)

Hypotheses

1. There is a significant positive relationship between pupil performance and openness of organizational climate of the school.
2. The innovative ability of the school is positively related to the openness of organizational climate.
3. Pupil performance is positively related to the high morale of the faculty of the school.
4. The innovativeness of a school is positively related to the high morale of the faculty of the school.

Tools

1. The Organization Climate Description Questionnaire (OCDQ) of Holpin and Croft (1969).
2. Purdue Teacher Opinionnaire (PTO) of Bentley and Rample (1970).
3. An Innovation Index Inventory prepared by the investigator to assess the innovative abitity of the schools.
4. A questionnaire for demograhic data and pupil performance data.

Sampling and Data Collection

Out of a total of 2,635 secondary schools in 46 educational districts of Tamil Nadu, all the 50 secondary schools in one educational district of Madurai, a set of 130 schools from another for educational districts of Madurai Revenue Division, and a set of 60 schools from North Madras, South Madras and Coimbatore, were taken as sample for the study. A pilot study to test the validity and reliability of the innovation index inventory was conducted on eight schools of Coimbatore. In all about 240 schools were taken up for the study, and on the basis of response through mail and personal visits, data was collected from some 208 schools. However, on further weeding out responses from 18 schools were left out as they were incomplete. The findings of the study are, therefore, based on response from some 190 schools of Tamil Nadu.

Significant Findings

1. Pupil performance is significantly better in open and autonomous climate schools than that of schools of other climate types.

2. Openness of climate does facilitate the capacity of the schools to adopt newer educational practices in greater number and in shorter time.
3. Performance of pupils in high faculty morale schools is superior to that of the average morale schools which in turn is better than the low morale schools.
4. The ability of the school to introduce innovation in educational practices is higher in high morale schools than the average or low morale schools. Higher the faculty morale, quicker and better is the school in introducing newer practices.
5. Both climate and morale are positively and strongly related to both criteria, namely innovative ability and pupil performance of the schools.
6. Of the eight dimensions of climate, four of them were found to significantly influence the level of performance of pupils in schools : esprit, thrust, disengagement, hindrance—the former two positively and the latter two negatively.
7. Of the ten dimensions of morale, all of them were found to contribute to the level of performance of pupils in schools; they are, in order of significance : curricular issues, schools facilities, services, community support of education, rapport among teachers, teacher salary, teacher satisfaction with teaching, teacher rapport *with principal, community pressures, teacher status and teacher* load.
8. The innovative ability of the schools is significantly influenced by the three climate dimensions—esprit, thrust and disengagement—the first two positively and the last negatively.
9. The four dimensions—school facilities and services, curricular issues, teacher salary and community pressures seem to influence the innovative ability of the school.
10. There is very high correlation between climate and morale indicating that they are highly dependent on each other

Correlation analysis showed that climate is positively related to pupil performance and innovative index and teacher morale is highly significantly correlated with pupils' performance and teacher morale. Besides, schools nearer to the open end of the continuum are found to have higher levels of pupils' performance. Opening up the climate means encouragement of a democratic style of administration and teaching, sharing of decision, group leadership, high faculty esprit. (Abstract : D. N. Khosla)

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A Study of Population Awareness among School Students in Goa (Standards VII-XI) as well as Teachers and Parents and their Reactions to the Inclusion of Population Education in the School Curriculum

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THE POPULATION in India is at present increasing at an annual rate of about 2.5 per cent. Though this rate of growth is comparatively lower than that of some Asian countries, the absolute increase of population it implies is terrific.

The abnormal growth of population has created many social and economic problems such as food problem, slow economic growth, low per capita national income, unfavourable age structure, high dependency ratio, adverse effects on national plans, labour and employment problems. Population growth in the modern world is a function of two variables: birth rate and death rate. The solution to our population problem lies either in our lowering the birth rate or increasing the death rate. The latter is morally untenable and hence our attacks should be in the sense of decreasing our high birth rate of 39 per 1000 per annum to at least 25 per 1000.

Priorities in Population Education

The background paper to the Second Asian Population Conference held at Tokyo in November 1973 classifies the persons, whom population education must be given, into three categories :

1. Population education in elementary and secondary schools.
2. Population education in educational institutions other than elementary and secondary schools and in training programmes for certain categories of personnel.
3. Population education for out-of-school youth and adults.

Review of Related Literature

Population education being comparatively a new area of study there is a paucity of literature on the subject. In India, it was in 1969 that the programme of population education was proposed to be introduced for the first time into the educational system of the country at the National Seminar on Population Education held in Bombay. Unesco entered in the field only in 1970 and thus a great spurt was given to the movement for the teaching of population education in schools.

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*Thesis submitted to the University of Bombay (1974)

In India, the National Council of Educational Research and Training, New Delhi, has taken a lead and has issued some publications on the subject like, *Population Education, Selected Readings, Reports of National Seminar on Population Education* and *National Conference on Population Education, Indian Population Situation*, etc. Similarly, Unesco Regional Office, Bangkok has come forth with a number of documents with the help of its team of experts, e.g. *The Schools and Population* by S. Viedermen, *Population Education—A New Role for the Region's Schools* by Dr J. Edlefsen, *Population Education and the School Curriculum* by Prof. Jayasuriya, *Issues and Problems in Introducing Population Education* by Dr. S. Wayland and many other reports and brochures which proved to be of much help to the researcher.

Books written by Indian demographers in special *Indian Population Problems* by Dr. S. N. Agarwale, *The Tragedy of Too Many* by S. L. Ogle and many other books on the subject written by Indian as well as foreign authors, gave the researcher a deep insight into the problem in hand.

Aim and General Objectives

The study of population awareness among the major components of the eductional process, namely, the school students, school teachers, and parents becomes, therefore, a necessary prerequisite to the inclusion of population education in the school system. With this intention in mind the author tried to investigate the degree of population awareness among school students in Goa (Standards VII-XI) as well as among school teachers and parents so that the necessary ground-work concerning the introduction of population education in Goan schools be completed. The study, therefore, partakes the nature of three different surveys. This abstract presents only the main points of these three surveys.

The broad objectives of the study were : (i) To assess the degree of population awareness among the Goan school students entering adolescence, Goan high and middle school teachers, and parents, (ii) To find out their preparedness for the inclusion of population education in the school programme, (iii) To understand their views regarding the ways and means of introducing population education in the school system (Standards VII-XI).

Questionnaires

The three questionnaires were, therefore, drafted with the intention of implementing the given objectives. The final questionnaire for students was prepared after having administered a trial questionnaire to a selected group of students of Standards VII-XI. The questionnaire devised for teachers was more or less modelled on that produced by the International Institute for Population Studies, Bombay, which had conducted a similar survey of teachers at Chembur in 1969. The questionnaire meant for parents was drafted keeping in view the diversity in the educational and social backgrounds of the parents in Goa.

The students' questionnaire could be conveniently divided into six parts in order to ascertain their knowledge about . (i) population facts, (ii) socio-economic factors affecting them in their day-to-day lives, (iii) factors leading to declining mortality and child deaths, (iv) causes of increasing and decreasing births, (v) size of the family, and (vi) the mode of introduction of population education into the school system.

The teachers' questionnaire consisted of 24 items divided into three parts (i) institutional data with three items, (ii) bio-social data with ten items, and (iii) opinion data with 11 items which were meant to elicit their awareness about the population problems in the country, the size of the family, sex education and the inclusion of population education into the school curriculum and its course contents.

Similarly, the parents were administered a questionnaire which consisted of (i) bio-social data with 8 items, and (ii) opinion data with 11 items. with the objective of drawing more or less the same information as in the case of teachers, but, without the items concerning the drawing up of course contents for a population education programme in schools.

Besides questionnaires, free use was also made of 'interview' as a tool of research in all the three surveys.

Selection of the Sample

Out of the three surveys, the major survey involved the students' opinions on population issues and population education. The students' sample consisted of 2,18 students of Standards VII-XI which formed about 5 per cent of the total school population of Goa district in these classes in 1971-72. The 30 schools in which the questionnaire was administered were chosen by the random sampling technique from all the 11 talukas of the district. Of the 2,183 students, 1,300 were males and 883 were females.

Standard VII was selected as the initial class for the survey because the students enter Standard VII at about 12+ which is the beginning of adolescence, at which age their actions are more thoughtful than in the earlier years of their lives.

The samples of teachers and parents were comparatively smaller consisting of 400 teachers and 200 parents. This was mainly because these surveys were subsidiary to the main students' survey. The 400 teachers from the middle and high schools formed about 15 per cent of the total number of teachers teaching in middle and high schools of 11 talukas of Goa district in 1970-71. Similarly, the 200 parents represented persons from different walks of life and belonging to different social and economic strata.

Findings

The analysis of the data collected leads one to the following broad conclusions:

1. The students of Standards VII-XI of Goa district, Goan teachers and parents are well aware of the population problem of the country. This has been revealed by the fact that 70 per cent of the students, 95 per cent of the teachers and 96 per cent of the parents do realize this fact.

2. Similarly, they are equally aware of the consequences of an abnormal population growth in the country. The percentages on this account are over 75 per cent. Scarcity of food, shelter, clothing and over-crowding of schools and hospitals is attributed by students to our enormous population. The teachers and parents interpret these facts in terms of unemployment, shortages and poverty.

3. More than 80 per cent of teachers and parents feel that school children must be made aware of the population problems of the country.

4. Goan students in general are not well conversant with the causes that have led to a decline in child mortality and the death rate in the country. On the other hand, they are conscious of the influence of early marriages (74 3 per cent) and of the family planning programme (67.2 per cent) on the birth rate. About 85.5 per cent of the parents too, were aware of the government family planning programme.

5. Goan students and parents believe in the small family ideal. The percentages in this regard are as high as 86.1 per cent and 92 per cent, respectively.

6. About 54.5 per cent of the parents and a large majority (62.7 per cent) of the teachers knew of the suggestion made by educationists and social scientists regarding the introduction of population education in the school system.

7. The three main participants in the educational process, namely, the students (73.4 per cent), teachers (73 per cent) and parents (79 per cent) are willing to have the subject of 'population' introduced in the school curriculum.

8. About 50 per cent of the students and 67.6 per cent of the teachers wanted population education to be integrated with other subjects. Similarly, 54.4 per cent of the teachers feel that the subject may be taught from Standards VIII or IX onwards.

9 Sixty-one per cent of the teachers and 54.5 per cent of the parents interviewed were not in favour of holding separate classes for boys and girls to impart population education. However, teachers in Goa (63.8 per cent) and parents (49 per cent) are not equally enthusiastic about teaching population education along with sex education.

10. Fifty-eight per cent of the teachers and 60 per cent of the parents thought school teachers to be the best agents for imparting population education.

Summary of Recommendations

Population education may be introduced in schools in Goa from Standard VIII onwards. The content would be integrated with other subjects and be taught by the subject teachers who would, at first, themselves receive some special training in the subject. The programme could be implemented as follows .

1. Before introducing the subject in the schools, a proper climate should be created. The Education Department of Goa, school managements and the headmasters of the schools are mainly responsible for generating an adequate atmosphere in the schools. The students should be motivated through an attractive curriculum and well trained teachers. The school management should be oriented to the new concept and the headmasters trained by a 'nuclear group', established by the Education Department of Goa, with the help of NCERT experts.

2. Population education should be introduced through an incremental-cum-sequential pattern. The Education Department of Goa should introduce the programme on a pilot basis in a few selected schools. The curricular reframing which the introduction of population education by an integrated approach may need, would be dealt with by the Education Department in the case of primary and middle schools, and by the proposed SSC Examination Board of Goa, at the secondary level.

3. The preparation of teachers for the new task of teaching population education should be done during their pre-service training and in-service programmes. The State Institute of Education which may be set up very

soon in Goa may undertake the in-service programme and a Population Education Centre may also be established in it. The proposed Goa University may introduce *Population Education as an* optional subject for graduation and at the M.Ed. level.

4. Ready-made instructional materials such as textbooks, reference books and audio-visual aids should be made available to the teachers. Initially, this should be supplied by the NCERT. Every school library should have a section of books on Population Education. The State Institute of Education to be set up in Goa may have a special section of books spread over the entire field of population.

5. Motivation of rural parents should be emphasized by educating them through Parent-Teacher Associations, Adult Education Centres, Social Welfare Agencies and Village Panchayats.

Population education is a rather new idea, and in view of the present situation in our country, it is an urgent educational and social need. Therefore, the programme should be implemented without any delay not only in the schools in Goa but also in every school in the country. □□

Research Notes

Trends in Social Studies Education: Theses at Canadian Universities (1960-1970)

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SIXTY-SIX THESES (60 at master's level and 6 at doctoral level) in social studies education were accepted at Canadian universities during the years 1960-1970 It appears that this number is the highest in social studies education during this period than in any corresponding period in Canadian educational history. Though the quantitative increase does not provide any evidence of qualitative progression, it indicates the increased emphasis being placed on the social studies education research at Canadian universities. In a broader context, the increased interest is also apparent in the whole area of "curriculum studies", one of the most neglected areas for research purposes at Canadian universities, as for decades the educational research in the field of psychology and administration has dominated the scene (and still does !).

Theses in Social Studies Education Accepted by Canadian Universities (1960-1970)

During the years 1960-70, as given above, a total of 66 theses was accepted by Canadian universities. Eighteen theses, the highest in the period under consideration, were accepted in 1969. On the other hand, none was accepted during 1961 and only one was accepted during 1960. The distribution by years is given in Table 1.

Universities Accepting Theses

Ten universities are included in this analysis. The University of Alberta has an unchallenged numerical leadership in the acceptance of graduate theses in social studies education. Out of a total of 66 theses, 31 were accepted at the University of Alberta. In fact, considering only the master's theses, the University of Alberta accepted exactly half (30) of the total of 60. In other words, the University of Alberta's total of

TABLE 1

THESES IN SOCIAL STUDIES EDUCATION ACCEPTED BY CANADIAN UNIVERSITIES (1960-1970)

Year	*Number of Theses*
1960	1
1961	0
1962	2
1963	5
1964	4
1965	3
1966	5
1967	9
1968	12
1969	18
1970	7
Total	66

30 (master's) was equal to the combined total of all other nine universities. Next comes the University of Calgary with 15 theses. This number is also exceptionally high, as the University of Calgary did not become an autonomous institution until 1966. The University of Toronto and McGill University with 7 and 5 theses, respectively, followed the University of Calgary.

Only three universities accepted 6 theses at the doctoral level. The University of Toronto accepted 4 followed by the Universities of Alberta and British Columbia with one each.

From the above it is quite obvious that the thesis most frequently accepted at Canadian universities is the master's thesis. The distribution of theses among Canadian universities during the years 1960-1970 is given in Table 2.

Educational Levels Investigated

A variety of educational levels received social studies education researchers' attention. Table 3 will elaborate further.

Exactly half the studies (33) pertained to the secondary level of education. This indicates the emphasis placed on research in secondary social studies education. Seventeen studies pertaining to the elementary level were accepted. Eight studies were concerned with elementary/secondary (combined) level. The junior high school has also been

TABLE 2

UNIVERSITIES ACCEPTING THESES

University	*Master's Level*	*Doctoral Level*	*Total*
Alberta	30	1	31
Calgary	15	0	15
Toronto	3	4	7
McGill	5	0	5
Saskatchewan	3	0	3
British Columbia	0	1	1
Dalhousie	1	0	1
Queen's	1	0	1
Saint Mary's	1	0	1
Victoria	1	0	1
Total	60	6	66

TABLE 3

EDUCATIONAL LEVELS INVESTIGATED

Level	*Number of Theses*
Secondary (Grades 9-12)	33
Elementary (Grades 1-8)	17
Elementary/Secondary Combined (Grades 1-12)	8
General	8
Total	66

included in this category. Eight theses have been categorized under general which include higher education, teacher education, kindergarten and also those studies which defied efforts at categorization under other headings. The number of studies pertaining to 'social studies teacher' and teacher education, tough very important areas of investigation, was relatively very small.

Content Areas Investigated

The social studies draw substantially from the entire range of the social science disciplines This section deals with the content areas anthropology, history, geography, economics, sociology, political science and social studies. A number of studies defy efforts at categorization. They are classified under 'general'.

Twenty-four theses are judged to be dealing with social studies, 2 with geography, 9 with history, 3 with economics and 3 with political science. There are 16 studies under the heading 'general', which include such topics as programmes of studies at various levels, teacher education and other general topics which do not fit in the other categories. There are no studies reported under anthropology and sociology.

It appears that history and geography still have a prominent place in the area of social studies education. Economics and political science have also begun to receive some attention of the researchers. The recent advent of anthropology and sociology in schools has not yet reflected itself in any of the studies during the period under consideration. Table 4 portrays content areas investigated.

TABLE 4

CONTENT AREAS INVESTIGATED

Content Area	*Number of Theses*
Social Studies	24
General	16
Geography	11
History	9
Economics	3
Political Science	3
Anthropology	0
Sociology	0
Total	66

Aspects of Social Studies Education Investigated

This section deals with various aspects of social studies education. These categories concerning with various components of social studies education have been arbitrarily created by the author.

'Teaching materials and aids' category seems to be popular with the researchers as 13 studies fall under this category. Next is 'methods' with 10 entries, closely followed by 'social studies programmes' with a score of 9. 'Development of concepts' and 'teacher education' have 6 entries each. Five theses are classified under the heading 'critical thinking skills and controversial issues'. 'Evaluation and objectives' received a score of 3 and 2 respectively. A number of studies could not be classified under any of the above categories; consequently they are under the heading 'general'. The distribution of various aspects of social studies education is portrayed in Table 5.

TABLE 5

ASPECTS OF SOCIAL STUDIES EDUCATION INVESTIGATED

Category	*Number of Theses*
Teaching materials and aids	13
Methods	10
Social studies programmes	9
General	7
Development of concepts	6
Social studies teacher	6
Critical thinking skills and controversial issues	5
Evaluation	4
Values, attitudes, and interests	3
Objectives	2
Skills	1
Total	66

Types of Research

It must be said that the subjective element has not been entirely eliminated in the process of classification of the theses under examination. Several of the theses make use of different types of research methods and a decision must be made with regard to their classification. A subjective judgment had to be applied (objectively ?) in such cases.

Twenty-nine theses are classified as survey, followed by 23 as experimental, 6 as survey-experimental, 4 as historical, 2 as survey-historical. None of the studies was classified as philosophical. Two theses were classified under the heading 'various other types'.

It appears that survey is still the most popular type used by the social studies researchers. This trend is amply substantiated by Brehaut's analysis of education research in Canada during the years 1956-58, 1959-61 and 1962-67.

A fairly good number of studies (23) is designated as experimental. This trend indicates a marked emphasis on experimental work. This is also substantiated by Brehaut's analysis of trends in theses in education presented for advanced degrees by students enrolled in English Canadian universities. As noted before, no interest whatsoever has been shown in philosophical studies. Table 6 shows types of research.

TABLE 6

TYPES OF RESEARCH

Type of Research	*Number of Theses*
Survey	29
Experimental	23
Survey-experimental	6
Historical	4
Survey-historical	2
Various other types	2
Philosophical	0
Total	66

Comments

It appears that a good number of studies reported were of a survey type, most of which gather their data through the questionnaire method, perhaps the easiest research method, often misused. On the contrary, in the period under consideration, there is probably a marked emphasis on experimental work. This is indicative of the fact that social studies education has arrived at a point where analytical and scientific methods of inquiry can be successfully used.

An examination of the theses indicates that very little critical research has been conducted on programmes for pre- and in-service education designed for and actually producing more effective social studies teachers. A fertile area for research !

It is clear that in Canadian universities more attention has been given to the studies dealing with the secondary social studies education than to any other level of education. It is suggested that other levels, especially the elementary level and the teacher education level should be given priority treatment, though it is not implied that the secondary level has to be neglected.

The foregoing analysis reveals that most of the research studies are dealing to a greater degree, with matters like instructional materials and methods. Moreover, most of them seem to concern primarily with the cognitive, as opposed to the affective domain of learning. The questions dealing with attitudes, beliefs and values are very vital for the social studies teachers. The affective domain of learning, neglected by researchers, could provide a fruitful area for future research.

Another important area which calls for research is evaluation. We desperately need good measuring instruments not only to measure students' knowledge of facts and concepts, but also to measure attitudinal and value changes. Construction and standardization of new tests in social studies or adaptation of the American tests in social studies to the Canadian scene could open a wide range of possibilities for future research.

There is little evidence of any 'pre-planned replication' or any systematic series of theses on a given topic or any series of follow-up studies, though some isolated instances are available. In this regard, the University of Calgary had made an appreciable attempt to produce four theses—in a series—on reading and interpreting vertical aerial photographs at the various grade levels. At this point in time, we not only need much more research in social studies education but also much more carefully designed and planned research.

A wide range of types of research is needed if we are to acquire a better comprehension of teaching/learning in the social studies classroom. Some areas for future research have already been identified In summation, we do need to tackle some ticklish problems in social studies education. Some such problems are as follows : evaluation, disciplinary versues inter-disciplinary approaches, identification of key concepts in social studies so that students may move from concept with cumulative progress, teaching loads and related teaching effectiveness, relationship between different methods and inculcation of values, attitudes and beliefs, relationship between understanding and commitment to action, expectations of various groups regarding the desired outcome of social studies teaching, teacher personality factors and their relationship to instructional competency in social studies, and selection, organization and presentation of subject-matter. It is obvious that these general problems are concerned with the whole field of education rather than the social studies education only. These suggestions might be lacking in specificity but they could provide fruitful researchable ideas

If we intend to improve the effectiveness of social studies teaching and learning in the classroom, we have to pay more attention to what research has to offer to the practitioner in the classroom.

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A Study of Some Child-Rearing Practices in a Socially Disadvantaged and a Socially Non-Disadvantaged Community

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THE TERM CHILD-REARING has been used to refer generally to *all interactions between parents and their children*. The interactions include parents' expressions of attitudes, values, interests and beliefs as well as their care-taking and training behaviour. These interactions affect the child's behaviour, whether intended to be so or not and influence his potentialities for future action.

Many studies have been conducted in Western countries on child-rearing practices. Several factors related to child-rearing practices have been investigated, e.g. order of birth, family size, social and economic class, cultural background, mother's personality and education of the parents (Davis 1943 and 1955, Davis and Havighurst 1968, Ericson 1946, White 1955, Sears 1957, Bronfenbrenner 1958, Bayley *et al.*, 1960, and Zurich 1971). Published studies on child-rearing practices among the communities in India have not been many. Minturn and Lamburt (1964), and Carstairs (1957) studied the child-rearing practices among the Rajputs in a village in Uttar Pradesh and the child-rearing practices among the three 'twice-born' castes of Rajasthan, respectively. Muthayya (1974) studied the attitudes of rural parents towards certain aspects of child-rearing practices In his study he has compared the attitudes of parents of different economic groups toward child-rearing. Although the general interest in social class differences is waning, much attention continues to be focussed on these differences in the area of parent-child relations.

The present investigation was planned to find out whether social class backwardness was a factor related to child-rearing practices. Aspects of child-rearing that were investigated were : (i) acceptance, (ii) rejection, (iii) possessiveness, (iv) child-centredness, (v) control through guidance, (vi) control through positive enforcement and love, (vii) control through guilt, (viii) principled discipline, (ix) intrusiveness, (x) hostile control, (xi) consistent discipline, (xii) autonomy, (xiii) hostile detachment and (xiv) withdrawal of relations. The questionnaire was a modified Telugu version of the Children's Report of Parental Behaviour Inventory (CRPBI) devised by Schaefer (1965).

The sample consisted of 30 Harijan mothers and 30 non-Harijan mothers drawn from two villages, Gajulamandyam and Thondavada, and their Harijanawadas. The families were matched for economic status (both belonged to the low socio-economic status) and also educational status (both groups had parents who were not educated beyond middle school). They were all agricultural/casual labourers. They were interviewed in their homes.

The responses for each factor were scored and on the basis of the responses the subject's position was fixed on a 5-point scale, that varied from full existence of the factors to its minimal existence

Results and Discussion

The mean of the scores on the various factors for the scheduled caste group and the non-scheduled caste group were compared. Table 1 gives the mean scores of these groups. There were significant differences between the scheduled caste group and the non-scheduled caste group in the factors : acceptance, possessiveness, control through love, principled discipline, consistent discipline, intrusiveness and autonomy. There was no significant difference between the two groups in factors such as child-centredness, rejection, general strictness, control through guilt, hostility and hostile detachment.

In other words, the 'socially forward' mothers were more accepting, more possessive, they exercised control through guidance and enforcement

TABLE

MEAN SCORES OF THE SOCIALLY ADVANTAGED AND THE SOCIALLY NON-DISADVANTAGED GROUPS ON FACTORS PERTAINING TO CHILD-REARING PRACTICES

No.	*Factor*	*Mean of Advantage Group*	*Mean of Disadvantage Group*	*Difference*	*F-value*
1.	Acceptance	4.16	3.03	1.13	11.41**
2.	Possessiveness	3.13	1.93	1.20	9.01**
3.	Intrusiveness	3.73	1.63	2.10	17.46**
4.	Autonomy	1.83	3.80	1.97	14.29**
5.	Child-centredness	1.61	1.41	0.20	1.10*
6.	Rejection	0.41	0.68	0.27	1.42*
7.	Hostile control	1.62	2.02	1.40	8.80**
8.	Hostile detachment	2.01	1.91	0.11	1.01*
9.	Control through guidance	1.82	1.94	0.12	2.14*
10.	Control through positive enforcement	2.60	1.60	1.00	11.12**
11.	Principled discipline	3.46	2.60	0.80	9.64**
12.	Consistent discipline	3.60	2.20	1.40	13.91**
13.	Control through guilt	2.15	2.45	0.30	0.54*

*Not significant
**Significant at 1% level

of discipline through love and the disciplining was more principled. The mothers were more intrusive, more consistent in disciplining and gave lesser autonomy to children than the socially disadvantaged or scheduled caste mothers.

Bronfenbrenner (1958) has shown that in Western cultures differences among social classes in child-rearing attitude and practices have diminished in the past twenty years. The blurring of social class distinctions can be attributed to many factors : rise in economic conditions, higher general educational levels attained, and smaller income differences between white and blue collar workers. Kohn (1959) attributes the differences among social classes in child-rearing practices to differences in values held. These in turn are explained by conditions of life of the various social classes.

The scheduled caste group studied here were Harijans and they all lived as a group in the Harijanawada of the village, while the non-scheduled caste group lived in the main village.

While it is difficult to ascribe any specific reason for the differences found, the one thing that is obvious is that the Harijans in this study operated as a small sub-culture with little familial interaction with other communities. Only within their community there were some opportunities to interact. Also among the members there was a feeling that they were inferior to others as a segregated group. Therefore, the differences found in this study may probably be adduced, with some caution, to the traditions, conventions and other sub-cultural influences of the Harijans, who constituted a single segregated group as distinct from others.

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On the Optimum Number of Choices In Multiple-Choice Items

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AS AN IMPORTANT STEP towards reforming the examinations, many universities in our country have restructured[1] their patterns of examination papers to consist of three sections or parts, viz., Part A—objective type items ; Part B—short answer questions and Part C—long answer essay/problem-solving questions. A few of these universities with the help of their more professional and progressive teachers have constituted initial banks of items including objective type and particularly multiple-choice and multiple-facet items. The Association of Indian Universities[2] through its Research Cell has built up question/item banks in various first degree level subjects involving nearly 3,000 teachers from various universities. At least 30 per cent of the total is made up of multiple-choice items. The quality of multiple-choice items depends to a large extent on the 'stem' and its 'distractors'. While stem is the question or the incomplete statement at the top of the item, distractors are those 'options' other than the 'key' or the correct answer. Usually four options are given, one of which is the key and the other three options are called distractors. The author elsewhere[3] has reiterated that the distractors must perform a 'dual' function—the more able students looking to them, must dismiss them as distractors and the less able students must be attracted towards them. This then is the real function of distractors and this will enable the key to have a *positive* and *reasonable* discrimination (ability to differentiate between higher ability students and lower ability students). It follows, therefore, that the multiple-choice items must elicit a behaviour pattern characterized by (a) the key chosen by a greater number of higher ability group than that of the lower ability group. The key will then have a positive discrimination, (b) the distractors must be chosen by a greater number of lower ability group than higher ability group. The distractors must have a positive discrimination. Elsewhere[4] an analysis for effectiveness of distractors has been presented to highlight these points.

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[1] V. Natarajan. Restructuring university examinations. *University News*, 14 *(11)*, 6-8 Nov. 1976

[2] Question Bank Book Series, 01 Mathematics, 02 Physics, 03 Chemistry, 04 Zoology, 05 Botany, 06 History, 07 Geography, 08 Psychology, 09 Economics, 10 Commerce, New Delhi, AIU, 1977

[3] V. Natarajan. *Towards better questions* (Item-writers' cookbook), New Delhi, AIU

Some Results

A 20-item multiple-choice test (in educational measurement) was given to 76 students and a count of choices (four options in every items) made in respect of all items considering a 27 per cent upper and 27 per cent lower and the middle 46 per cent (middle group). For a few items, the results are given below ·

Item No. 1

A	B	C*	D	
0	2	18	0	HAG
0	15	5	0	LAG
0	16	20	0	MG
0	33	43	0	WG

Item No. 5

A	B*	C	D	
1	15	2	2	HAG
7	3	5	5	LAG
6	10	7	10	MG
14	28	14	17	WG

Item No. 7

A	B	C*	D	
1	0	19	0	HAG
0	3	13	3	LAG
0	3	32	0	MG
1	6	64	3	WG

Item No. 18

A	B*	C	D	
2	15	1	2	HAG
1	15	1	2	LAG
4	29	2	1	MG
7	59	4	5	WG

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[4] V, Natarajan. *Monograph on test and item analysis for universities.* New Delhi, AIU, 1977

Here for some items of the three distractors, one is ineffective making the multiple choice item of four choices into one of three choices. For some other items of the three distractors, two are ineffective making the multiple choice item of four choices into one of 'constant alternative' of two choices.

Yet, for a few, all the three distractors are ineffective. The ineffectiveness of distractors is understood in terms of the distractors being not chosen at all by any or may be they behave in the same way as the key, i.e. more and more of higher ability students chose them compared to lower ability students. In respect of the key, every multiple choice item must have the right kind of FV (or difficulty) and DI. It is equally important that all the distractors must have negative discrimination. Therefore, it is seen that multiple choice items have 3, 4 or 5 (sometimes) choices per item. We have just seen that a four-option item in effect may be a two-choice or three-choice item. The question, therefore, is : What is the optimum number of options for a multiple choice item? This question is sought to be answered here from theoretical considerations first and from practical experimentation later.

Approaches

A few approaches are available at this point in time to be able to look at this problem from a theoretical angle. Each approach makes the assumption that the total number of alternatives is fixed, e.g. 40 3-option multiple choice or 30 4-option multiple-choice or 24 5-option multiple-choice. Thus keeping *total options* as 120. This will make sense if total testing time for a set of N items is proportional to the number of A choices per item. It seems likely that many or most item types do not satisfy the condition but doubtless some item types will be found for which the condition can be shown to hold approximetely. This means that those multiple choice items that require the student to read all options before choosing (especially items testing higher-order intellectual abilities) may demand this kind of assumption. The real relation of N to A for fixed testing time should be determined experimentally for any given item type. When N is not proportional to A, the theoretical approaches given here may be modified in obvious ways to determine the optional value of A for each item type. Many have investigated the optional number of alternatives for maximum test reliability. Their empirical evidence is somewhat contradictory. Ruch and Stoddard (1927) and Ruch and Charles (1928) conclude that because more of such items can be administered in a given length of time, two or three-choice item give as good or better results than do four and five-choice items. William and Ebel (1957, p. 64) report that "for tests of equal working time.. three-choice vocabulary test items gave a test of equal reliability, two-choice items a test of higher reliability, in comparison with standard four-choice items. However, in neither of them differences were significant at the 10 per cent level of confidence One of the ways to eliminate choice is to drop those shown by item analysis to be 'least discriminating'. This will be desirable practical procedure that must yield better results than simply eliminating distractors at random.

Approach or Method I

Let N be the number of items ; A choices per item. It is defined that the optional number of choices is the value of A that maximizes 'the discrimination function' A^N. The main reason to choose A^N is because it gives the *total* number of possible distinct response patterns on N-A choice items.

When NA=K is fixed (in the example discussed earlier it is 120)
A^N is maximized by $A=e=2.718$
For integer values of A, A^N is maximized by $A=3$
$\therefore$ When NA=K, three choices per item is optional.

An experimental investigation here is suggested

1. A test will be administered on at least 100 students with 40 items with three choices giving 40 minutes' duration.
2. The same test will be given now 30 items with four choices each for the same duration.

These will be marked and test and item analyses performed. Results will be compared and reported

Approach or Method II

This approach is based on Griev (1975) investigation. K-R formula 21 for reliability coefficient is considered and the coefficient (approximation) is maximized.

K. R. 21 $$r_{21} = \frac{N}{N-1}\left[1-\frac{\bar{x}(N-\bar{x})}{NK\sigma 0^2}\right]$$

$$= \frac{N}{N-1}\ 1-\frac{\bar{x}\ (N-\bar{x})}{N\sigma 0^2}\ldots\ldots \qquad \text{(i)}$$

Here $\bar{x} = \left(N+\frac{N}{A}\right)\frac{1}{2}$ Here N is the maximum possible score

N/A = chance score

$$\bar{x} = \left(N+\frac{N}{A}\right)\frac{1}{2}$$

s.d. $= \frac{1}{6}$ difference between maximum possible score and the expected chance score

$$= \frac{1}{6}\left(N-\frac{N}{A}\right)$$

Substituting for $\bar{x}$ and Sd in (i), we get

$$r_{21} = \frac{N}{N-1}\left[1-\frac{\left(\frac{N}{2}+\frac{N}{2A}\right)\left(\frac{N}{2}-\frac{N}{2A}\right)}{N\frac{1}{36}\left(N-\frac{N}{A}\right)^2}\right]$$

$$= \frac{N}{N-1}\left[1-\frac{\frac{N^2}{4}-\frac{N^2}{4A^2}}{\frac{N}{36}\ N-\frac{N^2}{A}}\right]$$

$$= \frac{N}{N-1}\left[1-\frac{\frac{N^2A^2-N^2}{4A^2}}{\frac{N}{36}\ N^2-\frac{2N^2}{A}+\frac{N^2}{A^2}}\right]$$

$$= \frac{N}{N-1}\left[1-\frac{\frac{N^2(A^2-1)}{4A^2}}{\frac{N^3}{36}\frac{(A-1)^2}{A^2}}\right]$$

$$= \frac{N}{N-1}\left[1-\frac{9(A^2-1)}{N(A-1)^2}\right]$$

$$= \frac{N}{N-1}\left[1-\frac{9(A+1)}{N(A-1)}\right]$$

This formula is useful only for large N

$$r_{21} = \frac{N}{N-1}\left[1-\frac{9(A+1)}{N(A-1)}\right]$$

Table below shows the nature of r_{11} as N → 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 120, 150, 200, 500. A → 2, 3, 4, 5

N	*A*	*2*	*3*	*4*	*5*
10		—1.88	—0.88	—0.55	—0.388
20		—0.3684	0 1052	0.2631	0.3421
30		0.1034	0.4137	0 5172	0 5689
40		0.333	0 5641	0.641	0.6794
50		0.4693	0 653	0 7142	0 7448
60		0.5593	0 7118	0 7627	0 7881
70		0.6231	0.7536	0 7971	0 8188
80		0.6708	0.7848	0.8227	0 8417
90		0.7078	0.8089	0.8426	0.8595
100		0 7373	0.8282	0 8585	0 8737
120		0 7815	0.8571	0 8823	0 8949
150		0.8255	0.8859	0.9060	0.9161
200		0.8693	0 9145	0.9296	0.9371
500		0.9478	0 9659	0 9719	0 9749

A 40-item three-option per item test seems to have a better value for reliability than a 30-item four-option per item test.

Approach or Method III

This approach uses the knowledge or random guessing assumption and the reliabilities for hypothetical tests of equivalent items. This assumption is not ordinarily satisfied in practice but it is unlikely to lead to measurable conclusions. The intercorrelation between two equivalent items under the knowledge or random guessing model' is given by

$$r^1 = \frac{r}{1 + 1/A - 1\ (p)}$$

where r^1 = product moment correlation between n-choice items when n=A. Here p and r denote the difficulty and product-moment intercorrelation of n-choice items when n = ∞ (Lord 1974). By the Spearman-Brown formula, the reliability of number right scores on a test composed of N equivalent A choice items is found to be

$$r'_{tt} = \frac{Nr^1}{1+(N-1)r'} = \frac{Nr}{(N-1)^r + 1 + 1/A - 1\ (p)}$$

$$\text{Since } N = \frac{K}{A};\quad r_{tt} = \frac{Kr}{Kr + (1-r)^A + \left(\frac{A}{A-1}\right)p}$$

we wish to know that value of A, the number of choice will maximize the test reliability r'_{tt}. The optimal value of A is the value that minimizes the denominator of equation above. The derivative of the denominator with respect to A is $1-r-\frac{1}{(A-1)^2}p$. Setting this equal to zero, and solving for A, optimal value is

$$A = 1 + \frac{1}{\sqrt{(1-r)p}}$$

It is easily verified that this value of A provides a maximum rather than a minimum for r'_{tt}

	p = 0.20	*p = 0.50*	*p = 0.80*
r = 0.10	3.36	2.49	2.18
r = 0.20	3.50	2.59	2.25
r = 0.30	3.67	2.69	2.34
r = 0.40	3.92	2.84	2.46
r = 0.50	4.18	3 00	2.58

Optimal values are independent of test length. For p=0.5, this approach is similar to the previous one. Table below shows some typical values of test reliability, for the case where p = 0.50.

		A = 2	A = 3	A = 4	A = 5
K = 150 ; r = 0.30	r'tt =	0.893	0.898	0.892	0.882
K = 250 ; r = 0.20	r'tt =	0.889	0.902	0.895	0.885

It is seen that three options MC item-test yields better reliability.

Approach or Method IV

A different perspective will appear when the item characteristic curve (ICC) model is applied to this problem. The characteristic curve of an item gives the probability of a correct answer to the item as a function of examinee ability. The function is usually answered to be a normal give or (it makes little difference) logistic function of ability, the range of the function being modified to allow for examinees who get the correct answer by guessing. The ICC is specified by three parameters that characterize the item ·

The location parameter b_i, the difficulty of item i,

the scale parameter a_i, the discriminating power of item i,

the lower asymptote c_i, the pseudo chance score level of item i. Lord demonstrated that for various values of c_i=0.20, 0.250, 0.33 and 0.50, keeping a_i and b_i constant, the test for which c_i = 0.33 had superior values of reliability. However, the item discriminating power depends on the number of choices/items. This of course has not been taken into account in the study.

It is also true that the effect of decreasing the number of choices per item while lengthening the test proportionately is to increase the efficiency of the test for higher ability students and to decrease its efficiency for low-level students. Suitable experiments can be devised to check the usefulness of approach. It is felt of course that three-choice item will be better.

It is possible for us to look at other aspects of the problem of 3, 4 and 5 choices per item. Multiple choice items with five options is common in American practice There is reduced probability of guessing (the probability is really 1/5 = 0.2 for guessing the correct answer). The same time, it must be said, in terms of items writing, there will be additional effort required to write five options. Multiple-choice items with four options is universal The probability of guessing the right answer is 1/4 =0.25. Multiple choice items with three options will have increased probability of guessing. It has been well demonstrated that formula scoring (correction for guessing $\left(R\frac{W}{N-1}\right)$ does not alter the rank order and the rank order correlation between obtained scores and scores corrected for guessing is very high. Item writers very often find it difficult to write more distractors which are all plausible. A three-option item is easier than a four-option item and certainly much easier than a five-option item.

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Effect of Content and Vocabulary on Reading Speed and Comprehending of Primary School Children

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LANGUAGE ABILITY INVOLVES proficiency in the four skills of listening, speaking, reading and writing. However, listening and reading are the means of acquiring and understanding new ideas and knowledge.

In this age of explosion of knowledge, proficiency in reading with speed has become essential for academic success. Learning depends largely upon one's ability to interpret the printed page fully and accurately. Thus, speed in reading has to be developed without jeopardizing comprehension, that is, the good has to be speed and adequate comprehension. Research has shown that once the basic skills have been developed comprehension does increase with speed. Shores (1961) concluded that fast readers are the good readers although it may be limited to particular types of material.

Referring to the earlier studies, Pressey and Pressey (1921) concluded that for primary grade children, based on the results of tests including poetry, scientific material, and stories, that, a good reader in one type of subject-matter may likely be a poor reader with other materials. Furthermore, Judd and Buswell (1922) found that different kinds of passages such as fiction, geography, rhetoric, and algebra, induced contrasting attitudes and distinctly different rates of reading on the part of individuals. Early investigators, such as Reudiger and Dearborn (1950), held to the view that rapid readers in one type of material were usually rapid readers in other type also. Bernstein (1955) showed that of two stories of equal difficulty, the more interesting one elicited the higher level of comprehension.

Looking into past, Pressey and Pressey (1920) reported that it is impossible for one to make a high comprehension score unless he reads rapidly. Carrille (1952) also found that if the reader has difficulty in comprehension, his reading speed slows down. Both these studies show that reading speed is positively related with reading comprehension. These studies are supported by Judd (1916), Lauer (1936), Tinker (1939), Shores (1950), Brim (1968), Alagriswamy (1970). In contrast to these studies, Flamagan (1939) found that increase in rate of reading decreases comprehension score, that is, reading speed and comprehension are negatively correlated. This study is supported by Anderson and Tinker (1936), Anderson and Dearborn (1941) and Perry and Whitlock (1948).

The vocabulary level of an individual seems to be of specific importance when attempting to understand speed of reading, because reading involves the ability to obtain meaning from printed symbols. Anderson and Fairbanks (1937) found that amount of increase in mean vocabulary scores correspond closely with increase in reading efficiency. Glass (1967) reported that the more familiar one is with meaning, the more rapidly one will be able to read printed materials. Read and Rogers (1957) said that developing vocabulary may result in increased comprehension. Dhar (1968) studied the problems of Indian students of the secondary level. One of the findings was 'mean vocabulary scores are higher than mean comprehension scores'.

Summarizing the results of earlier studies related to the effect of content and vocabulary on reading speed and comprehension, it may be said that reading speed is different in different contents. The vocabulary has a positive relationship with reading speed. In the case of relationship between reading speed and comprehension some studies reported that these are positively related whereas others reported contradictory results. Based on the above review, it was felt that the effect of content material and vocabulary on reading speed and comprehension needs to be investigated. The present study, thus, aimed at testing the hypotheses.

1. The content of reading material does not have significant effect on reading speed.
2. The content of reading material does not have significant effect on reading comprehension.
3. There is no correlation between reading speed and comprehension.
4. Vocabulary does not have significant effect on reading speed.
5. Vocabulary does not have significant effect on reading comprehension.

Method and Procedure

This is a descriptive correlational study where content material and vocabulary are considered as independent variables and reading speed and comprehension are treated as dependent variables.

Sample

The sample consisted of 35 primary school pupils of age 11+. These pupils belong to the Experimental School in the city of Baroda. The medium of instruction in this school is Gujarati.

Tools Employed

Vocabulary Test (modified form of Vakil 1955), Reading Comprehension Test (developed by the investigator), Reading Speed Measure and a stop-watch were used to measure vocabulary, reading comprehension and reading speed of pupils respectively. The three passages were selected for three different areas, viz. biography, story and history.

Basic vocabulary test of Vakil (1955) consisted of 1000 words. Out of these, 200 words were randomly selected. These words were given to 20 judges to rate them according to their level of difficulty. On the basis of their rating, 100 words were selected for the present study. For one word four meanings were given with one correct answer and three distractors.

The investigator selected three passages, in each area, viz. biography, story and history from general story books. The amount limited method was kept in view while selecting the passages. Each passage consisted of 900 words. These passages were given to the same 20 judges to judge their level of difficulty. On the basis of their judgement one passage in each area having same level of difficulty was taken for this study.

The reading comprehension test for each passage was developed. It consisted of 15 multiple-choice type of items with one correct answer and three distractors. Reading speed was measured by using a stop-watch.

Data Collection

The vocabulary test was administered to the sample of 35 students. The three passages were given to the pupils along with reading comprehension test. They were asked to read the first passage and as soon as they completed, they were to write minutes and seconds in the booklet, as written on the blackboard. Then they attempted a reading comprehension test, given at the end of this passage. When all pupils completed the reading and the test of one passage, they were asked to go to the next passage and the same procedure was followed.

Results and Discussions

Table 1 gives the means and standard deviations of reading speed and comprehension for biography, story and history. Table 2 gives the t-ratios of the reading speed and comprehension for different contents.

TABLE 1

MEANS AND STANDARD DEVIATIONS OF READING SPEED AND READING COMPREHENSION FOR B, S AND H (N=35)

Sr. No.	*Contents*	*Reading Speed*		*Reading Comprehension*	
		Mean	*SD*	*Mean*	*SD*
1.	Biography	2.98	1.309	45.88	27.066
2.	Story	2.51	1.317	48.23	28.745
3.	History	2 28	0.979	48.82	25.723

TABLE 2

SIGNIFICANCE OF DIFFERENCE BETWEEN MEAN READING SPEED AND COMPREHENSION SCORES OF B, S AND H (DF=33)

Sr. No.	*Contents*	*Reading Speed t-values*	*Reading Comprehension t-values*
1	B—S	1.468	0.347
2	B—H	2.500*	0.458
3	S—H	0.821	0.0892

B—Biography S—Story H—History

*Significant at 0.05 level.

Table 2 indicates that there are no significant differences among the mean reading speed scores for the groups of biography-story (B-S), and story-history (S-H). But there is a significant difference among the mean reading speed scores for the biography-history (B-H) at 0.05 level. The mean reading speed of pupils in biography is higher than in history. This shows that pupils read historical type of material at faster rate. From this it can be concluded that the different contents effect reading speed. Thus, the first hypothesis is rejected. This result is supported by Pressey and Pressey (1921), but contradicted by Reudiger and Dearborn (1950).

The same table shows that there are no significant differences among the mean reading comprehension scores of the pupils in different contents. Therefore, second hypothesis which states that the different contents do not affect reading comprehension is not rejected.

TABLE 3

CONTENTWISE RELATIONSHIP BETWEEN READING SPEED AND COMPREHENSION

No.	*Content*	*'r'*	*Interpretation*
1	Biography	—0.421	Significant at 0.05 level
2	Story	0.131	Not significant
3	History	—0.542	Significant at 0.01 level

Table 3 shows the contentwise relationship between reading speed and comprehension. It indicates that in biography and history the correlation values 'r' are significant at 0.05 and 0.01 levels respectively. In these two contents reading speed and comprehension are negatively related, which means that as reading speed increases reading comprehension decreases, whereas in the case of story the correlation value is found to be non-significant. So the third hypothesis as stated earlier is rejected. This result is supported by Flanagan (1939), Anderson and Dearborn (1941) and Perry and Whitlock (1948), and contrary to the findings reported by Judd (1916), Pressey and Pressey (1920), Layer (1936), Tinker (1939), Shores (1950), Brim (1968) and Alagriswamy (1970).

TABLE 4

CONTENTWISE RELATIONSHIP BETWEEN VOCABULARY AND READING SPEED AND VOCABULARY AND READING COMPREHENSION

Sr. No.	*Variables*	*Vocabulary*		
		B	*S*	*H*
	Reading Speed	0.362*	0.132	0.385*
2	Reading Comprehension	0.4717**	0.0613	0.4443**

*Significant at 0.05 level

**Significant at 0.01 level

Table 4 indicates the contentwise relationship between vocabulary and reading speed and vocabulary and reading comprehension. It indicates that the r-value between vocabulary and reading speed is positive and significant at 0.05 level in case of biography and history, whereas it is not significant in case of story. Therefore, a student with wide vocabulary would have good reading speed. The fourth hypothesis is rejected. This result is supported by Anderson and Fairbanks (1937) and Glass (1967). The 'r' value between vocabulary and reading comprehension is positively significant at 0.01 level in case of biography and history, whereas it is not significant in the case of story. Therefore, a student with wide vocabulary would have good comprehension, so the last hypothesis which was stated earlier, is rejected. This result is supported by Reed and Rogers (1957) and is contrary to the finding of Dhar (1968).

Conclusion

1. The content of reading material does not have significant effect on reading speed.
2. There is no correlation between reading speed and comprehension.
3. Vocabulary does not have significant effect on reading speed.
4. Vocabulary does not have significant effect on reading comprehension is rejected and content of reading material does not have significant effect on reading comprehension is not rejected.

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Effect of Training in Micro-teaching upon General Teaching Competence of Student-Teachers

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In this study, the investigators have planned to train student-teachers through micro-teaching approach and judge the extent of the acquisition of skills such as reinforcement, stimulus variation, probing questions, illustrating and explaining and General Teaching Competence (GTC) of trainees more adequately and scientifically.

Objectives

1. To bring about the desired changes in the general teaching skills of the teacher-trainees.
2. To compare the effectiveness of the micro-teaching technique with the traditional teaching method in the development of various teaching skills with respect to the GTC.
3. To develop the skills, viz., stimulus variation, reinforcement, probing questions, illustrating and explaining in the micro-teaching technique and to observe its effectiveness in the over-all development of teaching competence.

Hypotheses

1. There is no significant difference in the attainment of the micro-teaching group receiving feedback by peers and the traditional groups.
2. There will be no significant difference in the attainment of micro-teaching group receiving feedback by the supervisor and the conventional group.
3. There is no significant difference in the attainment of micro-teaching group receiving feedback from the peers and the group receiving feedback from the supervisor.

Sample

Twenty-one B.Ed. student-teachers of an education department teaching social studies in the secondary schools of Meerut were selected for the study.

Tools Used

1. Teaching Aptitude Test (constructed by K.P. Pandey)
2. General Teaching Competence proforma developed by the Centre of Advanced Study in Education (CASE), M.S. University, Baroda.

Delimitations

The present study suffers from all the inherent limitations which go with experimentation in the field of education. Below are given some of the limitations of the study :

1. The size of the sample may be considered to be very small for the

purpose of broad generalizations but the investigators had their disposal.

2. The tools used, although valid and reliable, may be described as wanting in sophistication, but this could not be helped.

Plan and Procedure

The design of the study is pre-test treatment, post-test control group. Three groups were formed on the basis of their scores obtained in the teaching aptitude test. The groups were equated in terms of scores. Total scores of each group were almost equal. Three groups of seven trainees each were thus formed. The first group is the micro-teaching group receiving feedback by the supervisor, the second is the micro-teaching group receiving feedback by the peers, and the third group is the controlled group, i.e. the traditional teaching group.

All the groups were giving micro- or macro-lessons, as the case may be. Then, the three groups gave three micro-lessons each and then the GTC was administered. The observation schedule of GTC consists of four sub-headings namely, planning (pre-instructional), presentation (instructional), closing and evaluation (post-instructional). There were 20 items on which each students-teacher was to be evaluated on a seven-point scale ranging from not at all to very much. It acts as a pre-test as well as the post-test for finding out the gain.

Five Skills

It was decided to test only five skills in the experiment : (i) Probing questions, (ii) Explanation of concepts and principles, (iii) Illustration of concepts and principles, (iv) Stimulus variation, and (v) Reinforcement.

Experimental Group

In this micro-teaching situation, seven pupil-teachers were chosen and given theory lessons on micro-teaching and on one selected skill, e.g. reinforcement. It is followed by a model micro-lesson given by the supervisor demonstrating that particular skill. One student acted as high school pupils. The micro-teacher taught for six minutes emphasizing one skill at a time, e.g. reinforcement. The supervisor sat at the back observing and noting down on an observation schedule. After six minutes. He replanned his lesson for 12 minutes and then retaught it to another group of six students for six minutes, and again got re-feedback from his supervisor. After 10 micro-lessons for each student (where five skills have been taught), the groups taught two more lessons and the GTC was measured by the supervisor.

Traditional Teaching Situation II

In this seven student-teachers taught full lessons of 40 minutes in the school situation. Rough lesson plan was discussed and corrected by the supervisor, after which he wrote his lesson plan. He then taught his first lesson to a group of 40 pupils in the school with the supervisor sitting at the back of the class writing comments in his lesson plan note-book on several points such as (i) introduction, (ii), motivation, (iii) questioning technique, (iv) explanations, (v) illustration, (vi) class control and discipline, (vii) pupil participation, (viii) objectives achieved, and (ix) personality and voice. After ten lessons were taught the supervisor observed two more lessons and measured GTC of these seven students.

Micro-teaching Situation III

Here the situation differs from the first situation where the supervisor gave feedback after the micro-lesson for each micro-teacher to the one where the feedback is given the micro-teacher by two peers (B. Ed student-teachers) who had observed and noted down their rating on the GTC. After six minutes' feedback, the micro-teacher replanned his lesson for 12 minutes and then re-taught his lesson to another group of students for six minutes. The two peers again gave his re-feedback on the second lesson. After 10 micro-lessons were given (where five skills were taught), the group taught two more lessons and the GTC was measured by the supervisor.

The results of this group was compared with the first group and it was noted if there is any difference in the GTC if the feedback is given by the peers rather than by the supervisor.

After these 10 micro-lessons were over and the 10 traditional-lessons were taught in the schools by the control group, both the experimental groups I and III and the controlled group II taught three micro-lessons in the school situation. Then the supervisors observed two more lessons of each group and noted down the GTC. The pre-test and post-test results of all three groups obtained were analysed and compared by computing the mean, SD and 't' in order to find out the difference in gain.

Table 1 reveals that in the supervisor group the mean of the pre-test is 29.3, whereas it is 40.43 for the post-test and in the percentage of gain M-11. This indicates that there is a gain in the group receiving feedback

TABLE 1

PRE-TEST AND POST-TEST MEAN, SD AND PERCENTAGE GAIN OF SUPERVISOR GROUP

Pre-test	*Post-test*	*Percentage of gains*
M =29.3 SD= 3.57	M =40.43 SD= 7.87 t= 5.2	M =11 SD= 5.14

by the supervisor. Similarly, the SD of the pre-test is 3.57 and of the post-test 7.87. The SD of the percentage of gain is 5.14. The calculated value of 't' = 5.2 is greater than the table value at .05 level (2.45) and .01 level (3.7) at six degree of freedom. Thus the null-hypothesis may be rejected. This provides a basis for the formulation that there is a definite gain in the achievement of students and the feedback by the supervisor contributes significantly towards GTC.

TABLE 2

PRE-TEST AND POST-TEST MEAN, SD AND PERCENTAGE GAIN OF TRADITIONAL GROUP

Pre-test	*Post-test*	*Percentage of gains*
M =29.7 SD= 2.75	M =35.43 SD= 3.66 t= 5.76	M =5.7 SD=2.46

It is apparent from Table 2 that the mean of the conventional group in the pre-test is 29.7 whereas it is 35.43 in the post-test. Thus the percentage of gain is 5.7 which is lesser than the percentage of gain of the supervisor group. The standard deviation of pre-test of this group is 2.75 and that of post-test 3.66 and there is a percentage of gain of 2.46. The value of 't' is greater than the table value at both the levels of confidence.

TABLE 3

PRE-TEST AND POST-TEST MEAN, SD AND PERCENTAGE GAINS OF PEER GROUP

Pre-test	*Post-test*	*Percentage of gains*
M =28.7 SD= 5.69	M =33 SD= 4.14 t= 2.78	M =4 3 S.D=3.8

Table 3 indicates that the mean of the pre-test is 28.7 and it is 33 for the post-test with a percentage gain of 4.3. The SD have been calculated as 5.69, 4.14 and 3.8, respectively for the pre-test, post-test and percentage of gain. It is evident that there is a gain of 4.3 in the case of this group, but it is less than the other two groups. The calculated 't'-value is 2.78 at six degrees of freedom. This provides very little basis for the formulation that feedback by peers contributed significantly in enhancing the gain in terms of GTC of the student-teachers.

Conclusions

1. In the experimental group receiving feedback by the supervisor, the mean of the pre-test is 29.3 where it is 40.43 for the post-test with a percentage gain of of 11.

2. The SD of the pre-test of the supervisor group is 3.7 and of the post-test is 7.87. The SD of the percentage of gain is 5.14.

3. The calculated value of 't' in the case of experimental group receiving feedback by the supervisor is greater than the table value at .05 level (2.45) and .01 level (3.71) of confidence at 6 degrees of freedom. The difference of mean gain is statistically significant and the null-hypothesis is rejected There is a definite gain in the achievement of the student-teachers. The feedback by the supervisor contributes significantly towards GTC.

4. The mean of the conventional group in the pre-test is 29.7 whereas it is 35 43 in the post-test.

5. The percentage of gain in the case of the conventional group is 5.7 which is lesser then the percentage of gain of the supervisor group.

6. The SD of the pre-test of the conventional group is 2.75 and that of the post-test 3.66 and there is a percentage of gain 2.45.

7. The t-value of the conventional group is 5.76, which is greater than the table value given at .05 level (2.45) and .01 level (3.71) of confidence at 6 degrees of freedom and the null-hypothesis is rejected.

8. The SD of the peer group is 5.69, 4.14 and 3 8 respectively for the pre-test, post-test and percentage of gain.

9. In the case of the experimental group (peer group) the mean of the pre-test is 28.7 and it is 33 for the post-test with a percentage of gain 4.3.

10. The percentage of gain in the case of peer group is less than the other two groups.

11. The t-value of the peer group is 2.78 at 6 degrees of freedom. It is greater than the table value at .05 level of confidence and the null-hypothesis is rejected at this level But the table value at .01 level of confidence is greater than our calculated t-value and the null-hypothesis may be re-

tained in this case (peer group) at .01 level of confidence. This provides very little basis for the formulation that the feedback by peers contributes significantly in enhancing the gain terms of GTC of the student-teachers

12. In the case of traditional and supervisor group the t-value is .42 at 12 degrees of freedom whereas the table value is 2.18 at .05 and 3.06 at .01 level of confidence. The difference is not statistically significant and the null-hypothesis may be retained.

13. The t-value of the traditional and peer group is .2 for 12 degrees of freedom. It is very much lower than the table value both at .05 and .01 levels of confidence. The difference of mean gain is not statistically significant and the null-hypothesis may be retained.

14. The t-value of supervisor and peer group is .56 at 12 degrees of freedom which is very much lower than the table value at both levels of confidence. The difference is not significant statistically and the null-hypothesis may be retained.

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Stable and Neurotic Boys and Girls in Relation to Maladjustment and Achievement: A Comparative Study

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NEUROTICISM is a primary structure and not merely a syndrome. The term 'neuroses' refers to a group of disorders in which the person has developed certain behaviour that avoid rather than cope with problems. If a realistic solution cannot be achieved, the individual either remains in a state of severe anxiety or resorts to one or more of the defence mechanism in an attempt to reduce anxiety. Neurotic behaviour is not readily apparent to others as is extraversions Neurotic behaviour has been described as a vicious cycle. The individual feels inadequate to cope with many everyday problems, so he avoids them by defensive manoeuvers; he then feels guilty, unhappy with situations that others handle with apparent ease. Despite the self-defeating nature of this behaviour, the neurotic individual clings rigidly to established behaviour patterns and seems unable to recognize alternative courses of action (Hilgard 1975).

Neuroticism as a personality dimension is related to adjustment in one or the other way. The term 'adjustment' refers both to a process and to a state As a state it refers to a harmonious relationship betwen the person and the environment. The degree of harmony is in part dependent upon certain potentialities within the persons, in part upon the character of the environment. In some cases maladjustment arises only from the interaction between the person and the environment—both being adequate when considered separately. The most important personality needs, if not satisfied and resulting in maladjustment, are thought to be those for (i) affection, (ii) belongingness, (iii) achievement, (iv) independence, and (v) social approval (Gates 1950). The need for achievement is more important from students' point of view. On the category of achievement depends his future prospects.

The present study is undertaken to find out difference between neurotic and stable boys and girls separately on emotional, social, educational and total adjustment (maladjustment) and also achievement.

It also aims at finding out significance of difference between opposite se: of the same dimension on the variables just mentioned above.

Sample

The subjects of this study were enrolled in Class XI in intermediat colleges of Moradabad city (U P). The subjects for the sample were randomly selected from eight boys' and girls' institutions. At the preliminar stage the sample consisted of 175 subjects—100 boys and 75 girls. The age-group ranging between 16 years and 19 years (mean=16.6 years). Finally, 20 per cent highly neurotic and 20 per cent highly stable boys and girls separately were selected out of the total sample. This selected group was meant for statistical treatment.

Instruments

Mandsley Personality Inventory (Hindi version) by Jalota and Kapoor (1971) was used to find out neurotic tendency in adolescents. Another instrument used was Adjustment Inventory for School Students by Sinha and Singh (1968). The inventory seeks to segregate well-adjusted secondary school students from poorly adjusted students in three areas of adjustment—emotional, social and educational. For the purpose of achievement marks of High School Board Examination were considered.

Data Analysis

On the basis of personality inventory scores subjects were categorized into four groups : (i) highly neurotic boys, (ii) highly stable boys, (iii) highly neurotic girls, and (iv) highly stable girls. As already mentioned, each group consisted of 20 per cent subjects of the boys' and girls' total sample. Adjustment and achievement data were treated with relevant statistics, i.e. by the *t*-test. The statistical details of boys' and girls' stable groups are given in Table 1.

From Table 1 it is clear that stable boys are less adjusted both emotionally and educationally in comparison to stable girls, though the mean difference is not significant. In case of social adjustment situation is just the reverse, though not significant. There is almost no difference between sexes on total adjustment. But the mean performance (academic) is better than their counterparts, though the difference is not significant.

The statistical results of neurotic group presented in Table 2 show similarity with the results of the previous groups But the main point of

TABLE 1

COMPARISON BETWEEN STABLE BOYS AND GIRLS

Dimensions	Mean		SD		't'
	Boys	Girls	Boys	Girls	
1. Stable Personality	4	5	1 45	1 00	2 77
2 Adjustment					
(a) Emotional	1.11	.7	1.08	.46	1 37*
(b) Social	4.40	4.90	1 34	.81	1.48*
(c) Educational	1 66	1 50	1.31	.80	1.42*
3. Total Adjustment	7.16	7 10	2.13	1.91	1 12*
4 Achievement	50 74	51.58	9.88	5 84	.89

*Not significant

consideration is that neurotic boys are maladjusted both emotionally and educationally and their mean difference is also significant. Social adjustment mean in both the sexes is like that of stable dimension and both are equally maladjusted. Overall neurotic boys are more maladjusted than girls and the mean difference too is significant. But the academic achievement of neurotic boys is better than that of girls.

TABLE 2

COMPARISON BETWEEN NEUROTIC BOYS AND GIRLS

Dimensions	Mean		SD		't'
	Boys	Girls	Boys	Girls	
1. Neurotic Personality	27.88	28.00	4.09	4.14	.18
2. Adjustment					
(a) Emotional	4 00	2.30	2.13	1.61	3.66*
(b) Social	6 31	6 90	3.68	1 91	.52
(c) Educational	4.69	2 60	3.13	1.97	3 90*
3. Total Adjustment	15.00	11.80	7 40	3 44	4.13*
4. Achievement	50.47	98.40	13.30	4 09	2.13

*Significant at .05 level

To sum up boys' achievement is better than that of girls. One of the contradictory aspect is that on adjustment scale the girls are more educationally adjusted, but their actual performance is less than boys' There may be certain other factors influencing educational achievement

Results and Discussion

On the basis of scores obtained by an individual on MPI, the boys and girls were classified as stable and neurotic. Stable students were those who scored less and their behaviour and adjustment was balanced, having no inconsistencies in their thinking and feeling. This type of individuals seems to be undaunted by everyday problems. On the other hand, neurotic students are those who scored high on the inventory and their behaviour has been described as vicious cycle. The neurotic individuals do not involve personality disintegration or loss of contact with reality and usually get along in society. This is very much in line with the findings of this study because as far as academic achievement is concerned in both the cases (stable and neurotic) the performance of boys is exactly the same. But there is a slight difference in the case of girls.

When we take up dimension-wise results on adjustment inventory, these are also in conformity with the previous researches. It has been found in general that emotionality is negatively related to academic achievement (Seth 1978). In the present study stable boys are emotionally less adjusted than girls and their achievement is also in the same order as described by previous researchers. But when we compare neurotic boys and girls, the boys are maladjusted or less adjusted but their achievement is not in the order of stable boys and girls, i.e. boys are academically better than girls. Stable girls are better adjusted educationally and their achievement is also better than their counterparts. In neurotic group girls are again more adjusted educationally but their achievement is not in conformity with previous group. There might be certain other factors which are influencing the achievement of boys and it may be due to other errors. As far as social adjustment is concerned the difference is not very large in both sexes and both the groups. In both the cases stable and neurotic boys are socially well adjusted in comparison to girls but the difference is negligible. On total adjustment of stable students there is not a marked difference between sexes but in neurotic group girls are better adjusted and boys are maladjusted. This last finding is not in accordance with the finding of Srivastava (1970) who found poor adjustment in neurotic adolescent girls. The achievement of less adjusted and maladjusted students is again not in accordance with the previous finding where Kumar (1963) found low academic performance of maladjusted students but in the present study the academic performance of maladjusted and less adjusted students is almost uniform.

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An Inquiry into Maladjustment among Juveniles (7 to 17) in Greater Bombay : Its Remedies and Prevention

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THE PROBLEM OF maladjustment among juveniles of the age-group 7 to 17 has become a tremendous one. Neither the educational authorities with the additional welfare services introduced in the schools are able to handle the situation nor the government with additional resolutions and regulations is adle to touch it even on the surface. The hue and cry of the parents of unmanageable children, the grumblings of the teachers of uncontrollable students and the anxiety of the authorities of dissatisfied students who use anti-social means of disturbing the very roots of civilized country through strikes, bundhs, gheraos and ask not what are enough evidences of the growing disillusionment and frustration among our youth today. The important questions that emerge from the above are : Why is this sorry state of things in our country ? What are our youth drifting to ? Have they not enough motivation in their educational pursuit to continue the same to its finality ? What stresses are they facing today that make them lose all their moorings in life to a state of wilderness ?

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*Based on research findings of the author's Ph.D. thesis

The problem is so vast and involves so many disciplines like, education and psychology, guidance and counselling, law and medicine that it requires to be studied in parts. For, a maladjusted child, may be due to physical disabilities, can be detected only by a medical practitioner, or, he may be due to educational dilemma, not knowing what to select from a hundred different courses and falling into one which saps his energies and leaves him a nervous wreck and can be helped only by an educationist, or perhaps, may be due to lack of intelligence and innate abilities and falls below standard and is branded as a slow learner or a retarded individual, and is helped only by a psychologist, or perhaps due to environmental conditions develop a number of stress situations and falls into personal problems behaving like a neurotic or psychotic and can be helped only by a counsellor, or perhaps falls into bad company and picks up a number of behavioural disorders disapproved by the society and may be corrected only by leagal proceedings by a court of law.

Objectives

The present research study is undertaken with the following objectives in mind :

1. To investigate the nature, degree and extent of maladjustment
2. To locate different areas of maladjustment
3. To help the maladjusted return to normality
4. To detect the factors of maladjustment with a view to arrest its spread
5. To help the personnel dealing with the maladjusted to draw out programme to help the abnormals.

The term 'maladjusted' is defined for this research study purpose as an individual who due to physical impairment or intellectual deficiency or social disability and/or emotional instability is unable to cope with his environment and fails to live as healthy, integrated member of the society.

Scope

With the vast topic of this nature, the investigator is forced to limit the scope of research to the following four aspects ?

1. The area of investigation is limited to Greater Bombay
2. The age-group covered is 7 to 17 years
3. The areas of maladjustment dealt with are : the physically maladjusted, mentally retarded, socially maladjusted and individuals with behavioural problems
4. All the institutions catering to the above groups of maladjusted are completely investigated into, along with the detection of the maladjusted children from the normal school-going population.

Method

Noting the vastness of the problems, the investigator began with the questionnaire technique. But very soon it had to be given up in favour of personal visit to the institutions and interviewing the inmates as well as the authorities administering the same. On several occasions the investigator had to arrange a string of interviews in order to understand the factors leading to maladjustment and this reverted to regular 'case work' technique. All the times 'group therapy' had to be contended with In some other areas of maladjustment, the investigator had to be acquainted with guidance and counselling techniques to solve the problems. Although observation of the maladjusted in their very set up was almost the first technique employed. No effort was spared to make the data as scientific as possible in its presentation through, statistical and graphic treatment.

Procedure

The investigation was conducted in two definite phases .

1. Collection of data of the confirmed maladjusted children of 7 to 17 years from the special schools and classes correctional institutions. After-care hostels, child guidance clinics, workshops and day-centres

for the orthopaedically handicapped children were institutionalized.

2. Collection of data of the maladjusted children of the 7 to 17 years from the ordinary schools of Greater Bombay. The investigator had to resort to the open forum of the questionnaire technique. In order to get first-hand information, the visits to the institutions were undertaken. To get more detailed information the heads of the institutions and the correctional personnel were interviewed and their records and assessments were noted.

Collection of Data of the Confirmed Maladjusted

(*a*) *The socially maladjusted* (*delinquents*) *:* The investigator had to devise separate questionnaire as each of the areas demanded inquiry suited to its nature, the scientific care needed and the training required of the personnel in each area. Later, for more detailed information, the visits were arranged to all the correctional institutions to collect the complete data about the delinquents.

(*b*) *The intellectually maladjusted* (*retarded*) *:* Next, the inquiry for the special classes/schools were sought for, the investigator prepared a questionnaire to find out the necessary information. This was supplemented by the visits to all the special schools/classes for the mentally retarded of Greater Bombay to collect first-hand information about the facilities for the educational training of the mentally retarded.

(*c*) *Behavioural disorders and maladjustments :* The investigator framed a questionnaire and sent it to all the clinics of Greater Bombay, as the inquiry demanded information in the area of behavioural problems leading to maladjustment. The researcher had a private interview with each multiple handicapped child. Next the visits were arranged to all the nine clinics in Greater Bombay to collect complete information about them.

(*d*) *The physically handicapped :* Every institution catering to the orthopaedically handicapped, the blind, the deaf and dumb and the sheltered workshops were personally visited and the heads were interviewed and the information collected.

Interviews with the Heads of Schools

The investigator moved to all the 120 schools on appointment and on several occasions spent a couple of hours with the principals of the schools.

Findings, Suggestions and Recommendations

Maladjustment has been found to be increasing in the age-group of 7 to 17 years and to fight it out, requires special techniques and skills. In general, to prevent and arrest maladjustment the following suggestions are made :

1. Schools should insist on selective admissions to prevent wastage and overcrowding in education.
2. To help poor students, the schools should coordinate with government organizations to extend scholarship facilities to the needy.
3. To lessen frustration in our children proper guidance and counselling services should be provided in every case of educational and vocational maladjustment.
4. Closer contact between teachers and pupils is most essential and to achieve that, educational methods like seminars, tutorials, group discussions, debates and study circles should be encouraged.
5. Schools should provide with library and laboratory facilities extensively and should also have canteen services.
6. School examinations which create a number of problems, should be made objective, and greater weightage should be placed on internal assessment, rather than external.
7. A number of co-curricular activities like hobbies, scouting, magazine-writing, NCC be introduced to every school.
8. Each school should provide for a students' problem centre to ascertain problems and be entrusted to the students' committees for effective working.
9. A scheme of national service will help to build the character, improve discipline and inculcate a faith in the dignity of manual labour to develop a sense of social responsibility.

For the prevention of subnormality the following suggestions are made :

1 There is a growing need for both special day and residential schools.

2. The need for trained teachers is the cry of the day and to educate the mentally subnormal, the teachers need to be specially qualified and necessarily should be of better metal
3. Diagnostic services should be available both in special schools/clinics and also in ordinary schools to detect subnormality at an earlier stage and arrest further damage to the personality of the child.

4. Mental subnormality can be prevented with the help of medical science and surgery and through research projects and studies in neuropathology. Severe subnormality may be prevented by birth control and sterilization.
5. Mentally subnormal need to be made useful to the community through industrial training of skilled and semi-skilled jobs.
6. The expansion of medical aid, health services, occupational therapy treatment and training would help to make the subnormal quite productive.
7. Parents of the subnormal need to be guided as to the attitudes they should develop in the rearing of such children. In many cases, counselling of the parents seems to be more important than that of the subnormal child.

For the prevention of educational backwardness a few more suggestions are given below :

1. Remedial teaching programmes need to be introduced in the training of teachers as well as an orientation programme for in-service teachers would prove useful.
2. The skill in the maintenance of cumulative record cards is essential and every teacher should consciously keep these records up-to-date to understand the growing child and visualize his psychological needs in advance.
3. Routine medical check-up in the schools is compulsory and every school should conduct it without fail and follow up the treatment with parental cooperation.
4. Individual attention and coaching should be given to the pupils in as many cases as possible to surmount difficulties at the initial stage.
5. Special facilities should be provided to the pupils to study in the school premises outside school hours either in the study-halls or in the classroom under the supervision and guidance of the teachers for the development of proper study habits.

The discovery of maladjustment depends upon the form it takes and its recognition and treatment upon the knowledge and understanding of those concerned and their tolerance of disturbance. Problems of development of nervous symptoms and physical symptoms are usually recognized by parents with the help of family doctor or referred to a child psychiatric clinic. Difficulties in personal relationships and educational difficulties are more readily recognized in the schools. Behaviour problems and anti-social behaviour emerge in the school or home.

Since diagnosis and treatment cannot be divided, a child psychiatric clinic, staffed from the educational and health services jointly and combining the assets of both, with a comprehensive range of intake and having closer relations with specialists in other spheres and with specialized means, would prove of immense help.

There are three steps in coping with highly problematic cases. The first of these is the accumulation of evidence regarding the patient and his difficulty. Secondly, there is the diagnosis by means of which the problem is identified and classified. Thirdly, there is the process of treatment itself which aims primarily at the reduction of difficulty, by determining its precise nature and causes, of conditions that underlie it. Evaluation of adjustment consists of guidance and counselling and psychotherapy.

To remove maladjustment totally is an impossibility, but there is a definite awareness of the problem and as such the society can be trained to face the problem squarely and overcome it. For that the family life in India needs strengthening up by family counselling and guidance services and by the education of the parents in the understanding of the children. Parents and teachers need close cooperation through parent-teacher associations.

Child welfare agencies and clinics should be able to provide foster-care and help to the needy parents. Education of children should be made job-oriented so that the school-leaver may get absorbed in suitable jobs and thereby divert their energies to constructive channels.

Conclusion

The study was able to detect 4,518 cases of maladjusted children in the age range of 7 to 17 years in Greater Bombay. Of these cases, 74.7 per cent were boys and only 25.3 per cent were girls. This shows that maladjustment is greater amongst boys as compared to girls. But it may be due to the parents, reluctance to give the information of the maladjusted girls. Moreover, some of the authorities dealing with the institutions for maladjusted girls specially Rescue Homes for girls are closed, even to the research workers.

Of 4,518 cases, 56.8 per cent were socially maladjusted or delinquents. This perhaps reflects the growing unrest, indiscipline and frustration found amongst the youths all over the country. Greater Bombay is no exception. Institutional care is found necessary as the number of indifferent parents. leaving their children to the certified schools as destitutes is inereasing. Out of 446 confirmed delinquents of the David Sasson Industrial School under institutional care, 204 were vagrants and left as destitutes by their parents. Thus 46 per cent under institutional care were destitutes and were found loafing at the street corners, sleeping in the railway compartments. The number of child beggers and children physically incapaciated is also increasing. In spite of the vigilance services to rehabilitate such children, police and the social services allow them to beg on the busy streets in Fort area. Truants and school refusal were found emotionally maladjusted. The investigator found it necessary to inquire into the situation of every child who remained absent. On testing the IQ of the same sample of delinquents, it was found that 36 per cent (out of 150) were below 10 per cent and about 66 per cent fall below 50th percentile. This proves that subnormal can easily fall victim to bad ways, as reasoning is low and undeveloped.

Out of 4,518 detected cases of mentally subnormal, only 927 were in special schools for the subnormal. Maladjusted children due to low intellectual conditions showed considerably more symptoms of depression, hostility towards parents and emotional tension. There was also higher incidence of speech defects, unsatisfactory attendance at school and anti-social activities. There was high prevalence of emotional instability among carebral palsy. Failure in reading and writing is common in children suffering from brain damage. As for the treatment of the educationally subnormal (retarded), psychotherapy could help children particularly affected by adverse environmental conditions. At present the number of special schools in Greater Bombay are 18 and 927 pupils are attending these schools The provision made for the educational facilities of these children is far from adequate. Besides these, there are other children who attend ordinary schools. Some are referred to the Guidance Clinics. Even between the special schools and the clinics the subnormals cared for, are about 25 per cent which is highly inadequate. Of 4,518 cases, 452 cases were of behaviour problems or personality maladjustment. The cases presented, ranged from minor behaviour problems to the backward, neurotic and psychotic. In some cases, hospitalized treatment, even when necessary, could not be carried out due to lack of facilities. The number of Child Guidance Clinics catering to their treatment is just nine.

Some of the maladjusted cases of children were found to be psycho-somatic, constituting physical impairment, either of sight or hearing or speech. The physically handicapped are more introverted and had high neuroticism. The deaf children present difficulties connected with bedwetting, fears, tantrum and withdrawal. Adjustment of the school programme to the needs of the physically handicapped and the retarded has not yet been given any consideration. There are only seven institutions for the care of the blind and three for the deaf mutes. In the absence of statistics, it is difficult to make an estimate of the physically handicapped. Quite a few of such physically handicapped are found in ordinary secondary school by the secondary schools are found to contain a large number of problematic or minor maladjustments.

According to the teachers' estimate, the maladjusted children were nervous, aggressive and showed symptoms of psychosomatic nature. They regarded the children with sex-misconduct quite seriously. Problems of insolence, unsociability and talkativeness were ranked next in the order of seriousness. According to them children showing overt misbehaviour were more of problem than those who were shy and withdrawn. The teachers and the heads were not happy with their repeaters and scholastically backward children, of whom some were retarded. In poor areas, the rate of failures per class was 15 to 20 in a class of 50 childern. The educationally backward tended to have low scores in tests of general ability, arithmetic, reading and vocabulary. There is no doubt that backwardness goes in hand with maladjustment. The clinical team attributed backwardness to emotional conditions to the extent of 67 per cent. The psychologists thought that physical conditions were responsible to an extent of 30 per cent. While the social worker considered family conditions responsible to the extent of 67 per cent. Thus, there was variance in the estimation of the causation factor.

According to the experts, personality factors have an impact on the scholastic achievement. High extroversion is related to a brighter intellectual level and higher academic attainment. There is a general agreement, that stability is positively correlated with academic success and that anxiety tends to interfere with scholastic progress. At certain levels anxiety is likely to be handicap, if excessive and if the task to be performed is a difficult one

Case studies of 25 problem-children, referred to the Child Guidance Centre of the Institute were undertaken which revealed parental neglect and lack of guidance in schools. The causal conditions of maladjustment are : (i) Environmental conditions (*a*) in the school, (*b*) in the home, (ii) Physical impairment, (iii) Intellectual deficiency, and (iv) Emotional disturbances

As for the home conditions, it was revealed that maternal deprivation was more likely to have ill-effects The paucity of trained teachers, lack of counsellors are responsible for the minor maladjustment

Serious attempts are necessary to contról the causal factors by the voluntary bodies, the home, schools and other agencies such as literature for children, films, youth clubs. Cinema is a contributory factor to delinquency, misbehaviour and nervous strain. The school conditions should not be so lax, as to allow the pupils to indulge in gambling (*Matká*) smoking or sale of illicit liquor, and even going to movies during school hours. Disciplinary action is to be taken, if and when, such cases occur. Perental neglect, insecurity, lack of recreational facilities, or employment opportunities can be avoided by making parents participate in the various school programmes. Frequent meetings of the parent-teacher associations will help in understanding some of the problems. Schools should also have vocational and educational guidance to avoid wastage and stagnation. The maintenance of cumulative record will greatly help the teachers to direct the progress of their pupils. Problem cases require after-care and follow-up work. It is necessary to have coordination and cooperation between school and employment services. Vocationalization of school courses will assist the pupils in their efforts to choose their occupations, to prepare themselves for entrance into it and to make progress in the same.

The study brought to light the need for understanding and sympathy in dealing with the maladjusted. Such cases tackled with consideration, with deep understanding and with the desire of what is impeding their adjustment and never to be judged *a priori* from external appearances Lack of sympathetic approach on the part of the teacher, just because he fails to understand repeated punishment, even when they fail to produce the desired effect, can cause incalculable harm to the child and complicate the issue still further. However, a sympathetic and understanding approach and acceptance of the child as he is, will rarely fail to yield abundant and rewarding results. If we succeed in helping a child to become well adjusted, fully satisfied, and fruitful member of society, we have done service to humanity and earned life-long blessing □

Book Reviews

Think First, Read Later !

Piagetian Prerequisites for Reading

T. Gary Waller (IRA Series on the Development of Reading Process ; edited by Frank B Murray), International Reading Association, 800 Barksdale Road, Newark, Delaware 19711, 1977, pp x+34

THIS VOLUME is the result of a summer institute at the University of Delaware. During the summer of 1974, the Society for Research in Child Development with the support of the Grant Foundation of New York sponsored a four-week Inter-disciplinary Institute on Reading and Child Development. In the thirty-three institutes faculty were researchers in the disciplines of psychology, psychiatry, education, linguistics, neurology, sociology, and the law. Each spent from three to five days at the institute formally and informally presenting the applications of their research to the field of reading The institute participants were advanced doctoral students and post-doctoral faculty from various disciplines who had an interest in and commitment to reseach in reading.

The monograph is organized around the notion that the child's reading behaviour is a developmental phenomenon. This means that, like other developmental phenomenon, there are certain necessary and sufficient conditions for it and that it changes both quantitatively (e.g. it becomes faster and more efficient) and qualitatively (e g. different and more complex models are needed to explain it) as the child ages. The book examines the development of reading from the perspective of the perceptual, cognitive, neurological, and linguistic prerequisites for it, specific factors in its acquisition, and factors which lead to the enhancement of the reading skill once it has been acquired.

The purpose here has been to examine the hypothesis that thinking, as basic psychological process or processes, is fundamental to and necessary for reading and, further, that reading as such cannot be understood until it is considered in a 'thinking' context and its relationship to these more basic processes is understood This hypothesis does not imply that reading must be reduced to thinking or that a complete understanding of thinking necessarily would lead to a complete understanding of reading, but only that thinking is a necessary (but not sufficient) prerequisite to and concomitant to reading at *any* level (beginning or mature), for *any* of its subparts (decoding or comprehension), and for *any* purpose (pleasure or information). At the very outset Waller admits that very little systematic investigation has been done in the area of thinking and reading in spite of the fact that thinking is important for reading. Waller further remarks that thinking, as an area of psychological research and theorizing, is too diverse to be dealt with in one monograph. So the tactic here is to examine briefly the relevance for reading of *one* major theoretical position, that taken by J. Piaget. There are three reasons for choosing the Piagetian position for examination. First, it is one, if not the dominant and best known extant theory of cognition. Second, it is comprehensive and developmental. Third, from the theory there are some fairly clear inferences to be drawn about reading ; and some reasonably precise *testable* hypotheses can be derived.

The various sections of the monograph provide a brief overview of Piagetian theory and point out its relevance for reading ; examine what evidence there is regarding the relationship between thinking, as viewed by Piaget, and reading ; and identify testable research hypotheses. One thing should be clear from the start, comments the author, that the major hypotheses to be proposed are that operational thought and perceptual decentration are necessary for successful reading acquisition and that formal operational intelligence is necessary for the comprehension of adult-level reading material. Let the reader be forewarned that what are put forward are hypotheses to be tested—not proclamations to be accepted as truth nor prescriptions to be embraced without further research and analysis.

Within Piaget's theory, thinking is based on a sufficiently large number of competencies and reading is certainly sufficiently complex that attempting to specify precisely the connection between the two is hazardous. It is in fact, difficult to specify the relationship between cognition during the 'sensorimotor period' (from birth to about two years) and subsequent reading process, except in the very general sense that experiences during this period lay the structural foundation for subsequent cognitive development. The early active engagement of a child with his world through manipulation of objects and materials is felt to be extermely important for cognitive development generally and, hence, for reading. Development of the symbolic function during the early 'preoperational period' (from ages two to four) is profoundly important for reading.

Frankly speaking, it is not to be expected that a child still in sensorimotor or early preoperational period will successfully learn to read by any reasonable definition Such a child simply does not possess the mental equipment to cope with the many complex demands of even simple reading tasks. This certainly is the case to the extent that reading requires development of the symbolic function.

As the child moves through the later preoperational years (ages four to seven), there is a gradual transition into the period of concrete operations (ages seven to eleven). It is during the transition between this later preoperational periods that a child typically is first exposed to formal reading instruction.

The final period of cognitive development is formal operations. In contrast to the concrete operational child, the formal operational child is capable of logical analysis and is concerned with the possible as much as with the real or concrete. That is, the older child has the competence to think in a very sophisticated logical way about hypothetical situations as well as about real (concrete) situations.

One way to systematically relate thinking and reading is to perform a task analysis of reading to describe what is involved when reading is considered broadly to include reading readiness, reading acquisition, and mature fluent reading. When a person learns to read, what is it that has been learned ? asks Gibson. Assuming first that a child has reasonable competence in a native spoken language, Gibson holds that the child then progresses through three successive stages in arriving at fluent reading : ". . . learning to differentiate graphic symbols ; learning to decode letters to sounds . . . ; and using progressively higher-order units of structure."

There have been a number of investigations to the role of preoperational and concrete operational thought in reading. These are in the form of correlational studies, comparative studies, and perceptual studies. Sufficient results are available to indicate that there is a positive relationship between reading performance and performance on tasks requiring concrete operational thought. Though the data indicate a relationship between operational thought and reading performance, the hypothesis that concrete operations are necessary prerequisites for reading cannot be accepted or rejected on the basis of the data that are available. "Does operational thought correlate with reading performance ?" is clearly 'yes' from a number of studies. But, can operational tasks be used as measures of reading readiness and/or predictions of subsequent performance in beginning reading instruction ? The evidence provided by Kaufman and Kaufman is suggestive. Is deficiency of operational thought a correlate of deficiency in reading ? Are the relationships general (one deficit to one deficit) or more specific ? Will practice on operational tasks improve reading performance, particularly for those having difficulty ? Will systematic experience with operational tasks improve reading 'readiness' for children in general ? There are no relevant data. Can performance on operational tasks be used in diagnosis and remediation (i.e. to aid in prescribing exercises for those with reading difficulty) ? Will teaching techniques based on Piagetian conceptions of operational thought facilitate reading acquisition ? The work of Rawson and her students holds considerable promise. Obviously, there is much more that can be done.

Finally, comprehensive, systematic, well planned and longitudinal investigations are needed which expand the data base from the pre-school years through the formal operational period which could provide satisfactory answers to the questions regarding the relationship between thinking and reading. A thought-provoking rather than answer-giving book with a large number of research references pertaining to the research work done in the area.

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The Classroom Language

Classroom Language : What Sort ?
Mrs. Jill Richards, George Allen and Unwin,
London, 1978, pp. 154. Price : £ 2.95 Sterling

WITH THE MODERN explosion of knowledge the newer methods of teaching in the classroom have come to be employed to make the children learn well and quickly. The child-centred learning has influenced the classroom language. This language is quite different than the everyday language that the childern come across. The classroom language is concerned with the particular subject under study as well as the language generally spoken by the teacher and the taught.

In this book Mrs. Richards dwells mainly on the language of the subject learning in the secondary schools. She critically examines the current thinking on language and learning and it can be applied to the classroom situations. She concentrates on the consolidated language demands of other subject areas and attempts to identify the range of everyday language in the schools. The book is divided into six chapters : (i) Introduction, (ii) Self-expression and Creativity as Language Limiting Cults, (iii) Strengths and Weaknesses of User Language, (iv) The Language Demands of Subject Learning, (v) Specialized Language and Concept Development, and (vi) Some Conclusions and Suggestions.

During the past half century the society in general has undergone a great transformation ideologically, politically and economically. These changes have made it imperative through pressures that education should provide for these changes by placing new emphasis on certain areas and subject conforming to the social and economical changes wrought in the society. The science and technological subjects have come into focus and the democratic trends have brought the rights of the individual in the forefront All these have brought a change in the language generally used in the class and in everyday life outside the class. These issues have exerted to discover a language of the school learning related to the subject demands. Newer methods of learning-group work, discovery approach, problem-solving, project method, etc. have brought their own peculiar language difficulties The effort to reduce the language and verbal explication can succeed by experimentation or performance but not in description or explanation Thus clarification of concepts depends on the use of a proper language by the teachers as well as its understanding by the pupils. Barnes (1969) has described what actually happens in such situations :

> This teacher teaches within his frame of reference , the pupils learn in theirs taking in his words which *mean* something different to them, and struggling to incorporate this meaning into their own frames of reference. The language which is an essential instrument to him is a barrier to them.

Mrs. Richards goes on to say that the pupils have not only to learn a subject ,but have to learn the language of the subject also. Some pupils pick up the language and manipulate it without having requisite understanding and there may be others who have better understanding than is manifested by their ability to express it. Teachers mostly overlook the former while they take a note of the later.

The author in her study conducted in 1971 discovered that the discovery method of learning biology was greatly influenced by the level of language competence, i.e. it was as effective as, and at times marginally more effective than, traditional methods with pupils having a high level of language competence.

Whatever the method of teaching be used to teach the pupils a subject, their success in learning what has been taught is subject of examination of some kind which takes recourse to the use of language. The success of a pupil depends on understanding and interpreting the language of the examination. The students often pick up essentials of their answers from the language of the teacher's questions rather than verbalizing in their own style. Students receive sure rewards for it. It creates a general feeling that such pupils have acquired the language of the subject and teachers feel that the concepts of the subject concerned have been acquired which may not be true. However, it is a recognized fact that the language of the subject needs to be simplified to make learning easier and thorough.

Mrs Richards examines different notions and theories concerned with understanding, the nature and function of language behaviour and quotes various studies to drive home her point. She comes to the conclusion that language ability in the children develops in relation to the social factors around them and their personality traits play a great part in it. The conceptual thought processes have also a role to play in developing language ability. Thus it becomes obvious that the language competence grows naturally through a range of experiences and individual encounters which stimulate language behaviour. As these experiences and encounters vary from one individual to another, the stimulation and acceleration of language proficiency in all its forms becomes desirable and essential. Listening, talking, reading and writing from the various parts of the language behaviour. The teachers through their teaching behaviour should provide opportunities and exercises to the pupils to develop their abilities in the language of the subject. These can be sharing of personal interests, discoveries and problems, taking verbal initiative, listening to others, discussing their difficulties conveying information, reading books, writing and talking in style to analyse the ideas of a subject and understanding and taking care of varied levels of difficulties in writing matter. It is but quite evident that the language ability and the learning are very closely related and a child's total growth is very much dependent upon his understanding of the language and his ability to make use of it in expression.

The teachers teaching subjects other than the languages and the teacher-educators must atleast once read this small book which will enlighten them about the language issue involved in learning ability of their students. This treatise is also of use to the linguists who have to keep a track of the newer developments of the language as a result of the newer methods and materials.

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Published by the University Grants Commission to promote scholarly study, as well as discussion, of contemporary problems and policies in higher education.

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The *Journal* is issued thrice a year: Monsoon, Autumn and Spring.

Select Contents of Early Issues (Vols. I and II)

Symposia on Undergraduate and Postgraduate Curriculum and Teaching, Higher Education and Equality—Special Problems of Scheduled Castes and Women, Examination Reforms, Special Feature on Administration and Management of Higher Education, Student Participation and Problems, Panel on Teacher Education, Collaborative Classroom Assessment, Research Studies on Higher Education in India, Documentation and Book Reviews.

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Subscription Rates

Annual Rs. 20 (India), £3 or $8 (Foreign); Single copy Rs. 8 (India), £1 or $3 (Foreign). For bonafide individual teachers and students in India, Rs. 10 per annum Enquiries regarding subscriptions may be addressed to the Assistant Education Officer, Publications Sales Depot, Ministry of Education and Social Welfare, 511 C Wing, Shastri Bhawan, New Delhi 110001 (India). □□

A QUARTERLY JOURNAL OF EDUCATIONAL RESEARCH

INDIAN EDUCATIONAL REVIEW

VOLUME FOURTEEN NUMBER FOUR OCTOBER 1979

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Students' Attitude towards the School

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This investigation has attempted to survey the attitudes of the students of Class X (the last year in school) towards the school. This study was conducted in a tribal area but represented the cross-sections of the population The study attempts to ascertain the differences in the attitudes of tribals and non-tribals, boys and girls as also the relationship of attitudes with various factors associated with the school such as distance of home from the school, vocational aspiration, success and failure in the school and the relationship between attitudes and the socio-economic status of the students.

ACROSS THE WORLD each year, thousands of children start out for their first experience in school with keen anticipation. They want to go to school. Most of them cannot wait It is impossible to forget the look of excitement on the faces of such children as the enthralling events of the day are recounted on their return from school. This feeling about the school persists into the early years of school. But soon afterwards, we hear the same children yearning for vacations or wishing that sickness would permit them to stay home from school. Their attitude towards the school has become clearly negative. We may have taught them to read, multiply and spell, but we have often taught them, may be inadvertently, to despise the process by which they acquired these skills. Yet, in the long run, a positive attitude towards learning may be the most important educational goal of all.

Attitude towards the School

Students are in school for at least ten years of their lives. During this period, they do have very pronounced views on their schools, on their teachers, on what they study, etc. But both the schools and the teachers have done a pretty effective job in building a barrier high enough to exclude serious consideration of the opinions of the 'consumers of education'. Besides, many of the school personnel are quite adamant in their belief that knowledge of students' attitudes towards the school has no relevance at all to the educational process

The reactions of high school students towards the school vary just as much as their aptitudes and abilities. Many appear to be completely at ease in, and satisfied with the school situation, others are irrevocably antagonistic to school, having mere existence in the school because of compulsion from home or other quarters However, studies by Jackson (1975) show that about 80 per cent of the students would place themselves in the 'like' category if asked to describe themselves as either 'liking' or 'disliking' the school. He also found that girls react more positively towards the school than boys. Similarly, Boyer (1959) found that 84 per cent of a group he studied were satisfied with the school.

Flanders and his associates (1964) found that attitudes become less favourable as the school year progresses. Coster (1959) found that students from families of the highest income level had the most favourable attitude, those from the lowest income level had the most unfavourable and students from the middle income families were between the two extremes in their attitude towards the school. Dale (1974) found that above 80 per cent of students of male, female and co-educational schools enjoyed school work and there was friendly relationship in the school

Leidy and Starry (1967) have reported that about three-fourths of the students sampled have responded positively to the question of their feelings towards the school. The question followed by the responses is :

Q : Taking everything into consideration how do you feel about the school ?

A .

	1953	*1958*	*1965*	*1967*
I like it very much	32%	27%	21%	16%
I like it most of the time	43	46	53	57
I don't like it very much	23	24	24	25
I dislike it	2	3	2	2

The authors have asked this question four times over a span of 15 years (1953-1967) and the results show that while the percentage of those who 'like' the school remain more or less constant, those who like it 'very much' diminished from 32 to 16 per cent while those who liked the school 'most of the time' increased from 43 to 57 per cent The school seems to be one of those places where the students would like to spend less of their time; they have other places where they would like to spend more of their time. The school is a place which they just 'like' but not 'like very much'.

Schools are not the only agencies responsible for education, but their role is crucial. Although a happy school is not necessarily an efficient one, it is important that they should be happy places for students who spend about a quarter of their wakeful hours in a year in them.

Rationale

Since attitude and behaviour are so much related, the importance of a positive attitude towards the school cannot be minimized Attitudes are related to both motivation and achievement. The problem of wastage and stagnation is a very grave one in our country and often these twin problems are connected with the lack of motivation and hence with attitudes. A teacher cannot ignore the feelings of the students if he wants to effect learning. It is the teacher's duty to change the negative attitudes into positive ones so that effective learning may take place To effect this change, it is essential to know them.

This study aims at surveying the 'liking' or 'disliking' of the students towards the school. The study attempts to find out if there is any difference in the attitude of the tribal and non-tribal boys and girls towards the school. Similarly, the investigation attempts to discover if the vocational aspirations of the students, the socio-economic status of the students, the distance of the home from the school as well as success and failure in examinations have any influence on the attitude of the students towards the school. Some of the possible reasons for their likes and dislikes are also attempted.

Sample

The students of Class X in the high schools of Shillong formed the population. The age of Class X students is generally 15+ and according to Morgan and King (1975), attitudes take final shape between the years 12 and 30. Class X is the last year in school in this area. Before leaving the school, the students will be able to look back and express their likes and dislikes regarding the school.

Shillong, the capital of Meghalaya, is a cosmopolitan city with representatives of tribal and non-tribal population. In fact, it was the capital of the undivided Assam which included the present Assam, Meghalaya and Mizoram Nagaland was also a part of it at one time. The tribals in Shillong include the Khasis, the Mizos, the Nagas and the Nepalese mainly with a few from the Garo Hills, Manipur, Arunachal and the Adivasis of Assam.

The non-tribals include mainly the Bengalese, the Assamese and the Hindi-speaking people with a few Punjabis, Anglo-Indians and a few from South India. Thus the population represents an excellent field for research. Moreover, the region is virgin as far as research is concerned

The population consisted of 1780 students in 50 high schools. The sample consisted of 23 per cent of the population or 409 students drawn from 13 schools in a stratified random procedure, based on the population figures. The strata were : tribal boys, tribal girls, non-tribal boys and non-tribal girls. The break-up of the sample is given in Table 1.

TABLE 1

THE BREAK-UP OF THE SAMPLE

	Boys : No	*239 Percentage*	*Girls : No.*	*170 Percentage*
Tribals . 216	124	57.46	92	42.54
Non-tribals : 193	115	59.74	78	40.26

While selecting the students, the following factors were also considered :

(*a*) Management of the school : government, deficit, ad hoc and private;
(*b*) the type of school : boys', girls' and co-educational ;
(*c*) the media of instruction : English, Khasi, Hindi, Bangali and Assamese ; and
(*d*) the socio-economic status of the students.

The break-up of the schools of Shillong is given in Table 2 and 13 schools were selected based on these figures.

TABLE 2

THE BREAK-UP OF SCHOOLS

Type	*Boys*	*Girls*	*Co-ed.*	*Total*	*Percentage*
Government	1	2	1	4	8.0
Deficit	5	6	3	14	28.0
Ad hoc	6	6	18	30	60.0
Private	1	1	—	2	4.0
Total	13	15	22	50	100

Tools Used

The following tools were used :

(*a*) An attitude scale was constructed and used.
(*b*) An adapted version of Kuppuswamy's socio-economic scale (1962) was used to find the socio-economic status of the students. It included the educational qualification and occupation of both parents The scores of both parents for each student were added and these distributed into a frequency.
(*c*) A proforma to find the vocational aspirations, the distance of home from school, the mode of going to school, failure in school, sex, age, community of the students was used to study the different variables

As the investigation sought to find the attitudes of students towards the school, there was need to specify what is meant by the term 'school'. On the basis of what was found in books especially Cook and Cook (1960) and earlier studies especially by Gopal Rao (1970), five components were selected : school image, curricular and co-curricular activities, inter-personal relations; teachers and teaching, and school administration. The specific areas under each were also identified and attitude statements (154) were gathered or written, and edited on the criteria prescribed by Edwards (1957). The list of these statements was submitted to a panel of experts and on the basis of their judgement 100 statements were chosen for the preliminary study.

For measuring attitudes, various methods were used like the method of direct question, the method of direct observation of behaviour, the method of equal-appearing intervals and the method of summated ratings. In the present investigation, the method of summated ratings of Lickert was followed. The preliminary scale of 100 items was administered to a sample of 100 students chosen at random The scripts were then scored and item analysis done as outlined by Garrett (1973). As a result of this item-analysis 20 statements were selected for the final attitude scale. These items had a DM of 0.70 or more and had a t-value of 2.85 or more which is significant at .005 level. The final attitude scale was administered to a sample of 409 students and the scripts were then scored and the various statistics calculated

Findings

The following were the main findings of the study :

1. The frequency distribution of scores showed that the sample was a representative one. The skewness (this is an indication of the

symmetry of a frequency polygon The more symmetrical it is, the nearer it approaches a normal curve) of—.12 indicates that the obtained distribution is slightly negatively skewed. The Kurtosis (this refers to the 'peakedness' or 'flatness' of a frequency distribution as compared to a normal curve) of 2.75 shows that the distribution is slightly leptokurtic (it means that a frequency distribution is more peaked than the normal curve). But there is no significant deviation of the obtained distribution of scores from normality.

2. The mean score for the entire sample was 76.77 out of a possible 100 points. This shows that the students as a whole are favourably disposed towards the school. The analysis of the responses to the individual items of the attitude scale also revealed the fact that the majority (about 75 per cent) are favourably disposed towards the school.
3. The different strata constituting the sample were given attention Table 3 shows the Mean, SD, D, DM and t-value of the different strata.

   Boys and girls differ significantly in their 'liking' for the schools, the girls being more favourably disposed than the boys. Similarly the tribals had significantly higher score than the non-tribals. Moreover, the tribal girls had the highest mean score of 81.89.
4. Regarding the vocational aspirations of the students and their relationship with attitude towards the school, it was found that those who wanted to be doctors, teachers and engineers had a more favourable attitude towards the school than those who wanted to be in the armed forces, business or were undecided

TABLE 3

Stratifications	*Mean*	*SD*	*N*	*DM*	*'t'*
Total Sample	76.77	9.17	409	—	—
Boys	75.28	8.63	239		
Girls	78.85	9.50	170	3.57	3.89
Tribals	78.53	7.99	216		
Non-tribals	74.80	9.97	193	3.73	4.14
Tribal boys	76.03	7.03	124		
Non-tribal boys	74.48	10.01	115	1.55	1.37
Tribal girls	81.89	7.97	92		
Non-tribal girls	75.27	9.90	78	6.62	4.74
Tribal boys	76.03	7.03	124		
Tribal girls	81.89	7.97	92	5.86	5.62
Non-tribal boys	74.48	10.01	115		
Non-tribal girls	75.27	9.90	78	0.79	0.54

5. The students whose homes were within one kilometer from the school were more positively disposed towards the school than those who were distant from the school.
6. There was no significant difference in the attitude scores of students who walked to the school or who used transport
7. There was significant difference in the attitude scores between students who failed in the school and those who did not fail Hence success in school is a factor that contributes to a positive attitude towards the school.
8. The scatter diagram correlating the socio-economic status scores with the attitude scores showed an 'r' of 0 32 which is significant. Hence there is a significant difference in the attitude towards the school when compared with the socio-economic status; the higher the socio-economic status, the more favourable the attitude towards the school.
9. The reliability of the scale ascertained by split-half method and the Spearman-Brown prophecy formula was 0.86.

Discussion

It is heartening to note that the students in general have a favourable attitude towards the school. The tribals exhibit a more positive attitude towards the school than the non-tribals This is perhaps due to the fact that many of them are first or second generation people attending the school and hence the initial enthusiasm. Tribals (78.24 per cent) as compared to non-tribals (58.03 per cent) consider the school as a pleasant experience. More probable is the general impression that the tribals are more conscious and convinced that schooling, that is education, is a factor *sine qua non* for their progress and prosperity. Hence they take pride in succeeding well in their studies, 76.86 per cent tribals as compared to 63.73 per cent of non-tribals. Even the illiterate parents of the students are convinced of this.

Moreover, the encouragement received from the parents, the support from the society combined with the efforts made by the voluntary organizations (mainly the Christian missionaries) in the education of the tribal students has created a favourable climate for education and this possibly could result in the positive attitude that they exhibit. It may be observed here that a good majority of the tribals are Christians, mainly in Mizoram, Meghalaya and Nagaland. Such encouragement, support and efforts may be lacking elsewhere which could possibly lead to the fact that the tribals elsewhere lack such positive attitude towards the school.

In the present study, only 9.70 per cent of the tribals as compared to 20.21 per cent of the non-tribals are of the opinion that students go to the schools because parents force them to go. Where force is applied, the attitude cannot be favourable and hence another reason why the tribals here seem to be more favourably disposed towards the school than non-tribals. This indeed is a fact and a good augury for the furtherance of education among the tribals.

Tribal girls have a significantly higher score than all the other strata. The tribal girls in the sample consisted mainly of the Khasis. The Khasi society is matrilineal and the girls have the pride of place. This probably is a reason for this high score. It may be added that the Khasi society (including the Garos too) is the only tribe in the whole of North-East India which is matrilineal. However, among the other hill tribals too, one notices that the representation of girls in schools, colleges and universities is getting closer to be at par with the boys. In any case, discrimination on the basis of sex is almost totally absent in the educational field as also in the society. Secondly, there are vast educational opportunities especially at Shillong which can boast of the finest institutions of this entire region.

Unfortunately this situation may not be true with the fellow tribals of the plains who are bound by age-old customs and other socio-economic constraints, that often stand in the way of the education of the girls. The tribal elders of the hills of this region desire nothing better than the education of their children and no difference is made between boys and girls. It is wished that the same could be said of the tribals of the plains.* Hence this difference of mentality could be a reason why the tribals exhibit a more positive attitude towards the schools and the tribal girls also exhibit a very favourable attitude towards the school. They find whole-hearted acceptance in the schools.

The tribals in general, and in keeping with their social character tend to accept the existing situation in school as best as possible while their non-tribal brothers and sisters are more critical in their attitudes and expressions. This tendency to accept the situation make the tribals have a more favourable attitude towards the school than the non-tribals. Table 4 shows few examples from the study which bring home this observation.

Success in school is a great motivational factor and this too is reflected in the attitudes of students towards the school. If they are successful they like the school and hence there is more positive attitude justifying the statement that 'nothing succeeds like success'. This was also manifested in the present study. Further study in this area will help in dealing with the twin problems of wastage and stagnation.

TABLE 4

OPINIONS OF TRIBALS AND NON-TRIBALS TOWARDS CERTAIN ASPECTS OF THE SCHOOL

Statements	*Percentage of tribals*	*Percentage of non-tribals*
Examinations are of no use	4.39	24.87
Only useless people take up teaching	14 38	24 36
Home assignments are a waste of time	14 80	27 46
Teachers do not teach well	16 43	29.79
Classes are boring	19.67	31 60
Punishment is not needed	23.11	37.01
Textbooks are uninteresting	27 70	41.19

Out of 409 students, 92 (22.50 per cent) had failed at least once but they still continued their studies. It has not been possible to consider the many more who have dropped out of school. Those were beyond the scope of the study and it is to be presumed that they would have a more negative attitude towards the school. Why else did they drop out ? Then again, while, we say that success in school is a factor that contributes towards a more positive attitude, are we justified in assuming that a more positive attitude could lead to greater success in the school ? One would be inclined to think so. They are complementary This is precisely the way attitudes function. If we have a favourable disposition towards an object, our behaviour too tunes itself towards the object and tries to achieve the object. However, this aspect may be further researched into and the results are bound to have far-reaching consequences.

Distance of the school from the home affects the attitude of the students towards the school. The nearer the students are to the school, the more favourable the attitude. In this connection, the first All India Educational Survey wanted schools to be established within walking distances.

The present study attempted to identify some factors that influence students and contribute to the formation of attitudes. It would be of great use if other factors are also outlined in two categories. The first category would consist of factors that contribute to the formation of positive or favourable attitudes towards learning and the school; the second category would consist of those factors that affect negatively and thus unfavourable attitudes are formed.

It was beyond the scope of the study to detail the reasons for the students liking or disliking the school. However, the responses to the attitude statements and questions indicate the possible reasons why the students like or dislike the school. Some of these are enumerated below :

(*a*) Factors that could contribute towards a positive attitude towards the school ·

- *i.* they have pride in their schools;
- *ii.* there is friendly relationship with fellow students,
- *iii.* what is learned in school will be useful even after leaving the school; and
- *iv.* success in life depends on the success in school

(*b*) Factors that could contribute towards a negative attitude towards the school :

- *i.* there are too many rules, there should be more freedom in the school;
- *ii* the students are afraid of the teachers, the teachers do not respect the rights of the students ; and
- *iii.* there is too much to study.

Further, from the analysis of the questions and statements, it is clear that the school is a pleasant experience because there is a feeling of friendliness among the students (89 25 per cent). They also feel that the school is an important factor in their later success (89 51 per cent). But the other factors that should have contributed to a favourable feeling towards the school are, unfortunately, on the unpleasant side such as, textbooks are uninteresting (34.59 per cent), there is too much to study (67.20 per cent). The recommendation of the ·Review Committee (Ishwar Bhai Patel Committee Report) to lessen the load is, therefore, welcome Again, while the students feel that rules are necessary for the good running of the school (94.76 per cent), about 47.67 per cent feel that there are too many rules; about 29 17 per cent feel that punishment is not necessary in the school; and about 29.22 per cent want more freedom in the school.

Regarding the teachers, a great many (77.48 per cent) look up to them and admire them. But 36 01 per cent are afraid of them; 32.52 per cent think that the teachers could be more fair and honest; and a sizable number of students (38.87 per'cent) want the teachers to respect the rights of the students.

These are a few of the observations that could be elicited from the study. Further researches must be conducted in this area to identify in detail the factors that contribute to a positive or negative attitude towards the school. Once these factors are known, efforts can be spent to strengthen the positive ones and change the negative ones. This is the most important function of an educator. The schools will then be happy places as they ought to be.

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Education, Employment and Income Inequality : A Marxian Perspective

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THE IMPACT of educational expansion on income distribution is a matter of great concern to a large portion of population in a poor and inegalitarian country. And that all classes do not share equally in the benefits of educational growth is also a fact disputed by none P. C Mahalanobis, thinking of education in India, observed :

> By and large, it is the rich people who have the opportunity of giving their children the type of education required for posts of influence *and responsibility in the country*... This has created an *influential* group of people who naturally desire to maintain their privileged position and power ·the power and privileges of the small group of people at the top tend to be not only preserved but strengthened [1]

At a later date the Report of the Education Commission (1966) reaffirmed :

> The social distance between the rich and the poor, the educated, and the uneducated is large and is tending to widen...education itself is tending to increase social segregation and widen class distinctions.. What is worse, this segregation is tending to widen the gulf between the (privileged) classes and masses.[2]

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*The author is grateful to Professors Handa and Joya Sen for initiating his interest in writing this paper.

[1] Quoted in Myrdal (1970), pp. 196-97

[2] Quoted in Myrdal (1970), p. 197

By contrast, the proclaimed objective of ever increasing expenditures on education is to facilitate vertical socio-economic mobility of the underprivileged sections of the population. This paradoxical and repressive aspect of education is a result of the upper-class power in operation in inegalitarian and class-ridden society. Failing to recognize the importance of the upper-class power in securing access to educational and labour-market opportunities, most of the researchers in India (as elsewhere), with notable exception of Bhagwati (1973), have been obsessed with 'investment-in-man' model and have approached the issues relating to education in a rather crude and unenlightening manner.[3] This is somewhat damning in view of the fact that a more insightful alternative may easily be extracted from Marxian literature. In the present paper an attempt is made to spell out a theoretical model which seems to be offering a fairly comprehensive and stable explanation for the observed interrelation between educational expansion and inequality. It essentially focuses on the differential access of members from different socio-economic classes to educational institutions and, subsequently, to the labour market slots.

Whether educational expansion would lead income distribution towards or away from equality depends on the precise model of education (describing class distribution of the benefits from educational expansion) and labour-markets (defining the relative importance of educational qualification vis-a-vis other factors in providing access to members of different groups to favoured market slots).[4] In a complete neo-classical world (Becker 1964, Schultz 1962), where capital markets are so perfect as to even equalize the returns on human and physical capital, each decision-making unit earns equal returns to investment at the margin in equilibrium and both rich and poor have automatically equal access to education and better-paid jobs The human capital theorists, thus, formally exclude the relevance of class-structure and power relations to the issues like the kind of schools we build, the extent of schooling done by children from different socio-economic groups and the allocation of labour-market slots The human capital theorists' framework, as a result, becomes so superficial as to be virtually irrelevant, even misleading, to the task of understanding, in a world substantially different from that of Becker (1964), the process through which the benefits from educational institutions and, subsequently, from the labour market are distributed among different socio-economic groups. Bhagwati (1973) in his 'job-access' paradigm, explicitly recognizes the influence of economic power and class-structure on the receipt of the benefits from the pattern of educational expansion in the country. The influence of class-structure on the distribution of labour-market benefits, however, is largely ignored[5] in his model through the assumption that the access to better-paid jobs is determined by the educational credentials one holds. A person familiar with the labour-market functioning knows very well that a worker attributes other than educational qualifications (caste, sex, age, domicile, family, etc.) and also plays a significant role in making access to favoured positions. Marxin theory (Baran and Sweezy 1966, Bowles and Gintis 1975), in our opinion, is the most comprehensive one—as it encompasses social, as well as technical relation of production and also accounts for the role of education in reproducing or transforming present socio-economic order.[6] It easily explains why non-professional attributes of workers are important to the employer. One difficulty with the model, however, is that it overlooks the significant role employees play in the distribution of job-slots of the organization they belong to. In the following paragraphs the model, with a suitable modification to overcome the difficulty, is combined with Swinton's model (1977) of labour-market discrimination to obtain a more insightful model to analyse the inter-relationship between educational expansion and income equality.

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[3] Myrdal (1970) also maintained that the 'investment-in-man' (or extended capital output) model blocks the way to realistic and socially relevant research

[4] Expansion of education also affects income distribution, though indirectly, by generating greater sensitivity of people to economic inequality and social injustice The sense of equality is a function with many arguments, however, and education is one of them. Some perceptive observers (Myrdal 1970, Dube 1976) have already noted that rather than contributing to social mobility and equality, Indian education legitimizes inequality. At best it creates ambition to climb privilege

Education is in part organized to produce worker traits—'human capital' —demanded by employers. It is, however, highly simplistic to assume, as the human capital theorists do, that the supply of human capital is the simple aggregation of one's own or one's family's choices as regard to investment in education for the sake of future pecuniary or non-pecuniary returns. The fact that education is largely carried out by governments or through governmental subsidization, in India and many other countries, suggests that more basic social forces may be at work. Issues of power, and ultimately of class-structure, enter on a rather fundamental level in determining the pattern and organization of educational system, that is the kind of schools the country builds, and the amount of schooling the children of different classes do As Bowles (1971) has argued, in capitalist LDC's (a group to which India belongs) the pattern of expenditure and governmental subsidization on education are likely to be effected in a manner favourable to the elite groups How do the resourceful elite groups persuade and cajole the State machinery into taking care of their interests ? The issue is rather complex and beyond the main thrust of the present paper. That they successfully do so in matters relating to industrial and import licensing is well evidenced in the published literature (Bhagwati and Desai 1970, Shorie 1973). And education in fact is still a softer area for them on account of idealistic touch and middle class support lent to their interests. As Naik (1976) noted. it is the education of the well-to-do that ultimately receives greater attention and more funds. Whenever there is a choice between further or better education of those who have had some, and some education at least of those who have none, the decision is invariably in favour of the former In India, for example, although the declared policy proposals consistently have been to give priority to the extension of popular education and the liquidation of illiteracy, secondary schooling has been rising much faster and tertiary schooling still more rapidly than elementary schooling. There is a fairly general tendency for planned targets for increased primary schooling not to be reached, whereas they are over-reached, sometimes substantially, as regards to increases in secondary and, particularly, tertiary schooling This has all happened in spite of the fact that secondary schooling tends to be three to five times more expensive than primary schooling, and schooling at the tertiary level five to seven times more expensive than at the secondary level (Myrdal 1970). In the same vein business and technological institutes come up at a faster rate than the sub-professional schools.[7]

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[5] Bhagwati, in fact, takes note of the widespread practice of appointment on the basis of the principle 'who knows whom'. But he does not incorporate this phenomenon in his theoretical model.

[6] Education contributes to the reproduction of existing social and economic order by attuning the students to a set of social relations similar to those of the work place which are characterized by a hierarchy which ascends in visible gradation from workers with virtually no control over production, through those with control over limited sphere to those who exercise effective control over almost all aspects of production process.

The candidate's class-position and economic status exert substantial influence on his/her effective access to educational institutions. While the educational institutions, in principle, are open to all classes and castes the effective access to educational opportunities, in general, vary directly with the student's economic and social status. The available data, from various surveys and census inquiries, on enrolment and attendance at primary education in India reveal that the phenomena of 'non-entry', 'irregular attendance', 'repeating', and 'dropping out' are observed mainly among the children of poor and socially depressed families. Low-income (and, very often, socially low status as well) groups typically fail to take advantage of primary education because for them opportunity cost of labour and capital tend to be very high (sometimes prohibitive) and benefits of schooling very low (Bhagwati 1973). Since the struggle for livelihood is serious for these families they use children of primary-school age in gainful work. Exclusively full-time schooling, therefore, is unsuitable for these children.[8] For some families even the costs of books and other recurring costs of school attendance are unbearable. Not only that they have to plunge deeper into indebtedness with exorbitantly high interest rates but very often it is just impossible for them to borrow money. The social barrier may also be blocking the way of the low-caste children. Moreover, positive incentives for primary education are insignificant on account of their low expectations as to make inroads into rural as well as urban job markets. Benefits from primary schooling through increased productivity in family occupations too are meagre, if any. Thus, despite tuition-free public primary schooling, according to the picture depicted in 1971 Census of India, about 20 per cent of children do not enter the school system at all; and every 100 children that do so, as many as 60 do not complete primary schooling (Grade I to IV/V) and yet another 25 drop out before entering the higher secondary schooling (Grade VIII to matriculation). The drop-outs are mostly the children of poor parents who are compelled to work and, therefore, cannot attend the exclusively full-time (with single-point entry and sequential promotion) schools. Out of those who manage to go to secondary schools—thanks to better resources or greater individual and parental determination—progressively lesser number passes matriculation and go further up in colleges and higher degree institutions. Substantially large portion of student population in colleges and higher degree courses come from families of urban middle and upper classes. Low participation rate for the lower income groups in these institutions can be explained in the similar terms as suggested for the same phenomenon at the primary level But there is still more to be added The higher income groups confer an unequal advantage on their children by being able to invest more money in their education either by giving them better-quality education through more expensive private schools or by hiring private tutors to improve performance at critical competitive examinations such as those for Matriculation, the Intermediate Science and Bachelor's Degree. The most outrageous and indecent facts, however, are related to the practices used to manipulate marks and secure admissions to the most remunerative and prestigious degree courses such as medicine, engineering, and business. Money, relation to concerned officials, and recommendation letters from influential people are powerful enough to smuggle a candidate into prestigious educational courses and institutions. Some fond parents will go to any extent to obtain a 'guarantee' that their son or daughter will be accepted. These factors provide an additional muscle to the children of the rich families enabling them to eliminate, in the very beginning, the smarter but poorer (both money-wise and influence-wise) candidates. Practice of reserving some seats for socially backward class candidates does not really affect the children who were born with silver spoons in their mouths. Some middle class children have to forego their chances. Differential 'access' to educational opportunities are thus governed largely by the differential economic and socio-political power invested in different socio-economic classes.

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[7] Finding more and more middle-income and lower-income group students academically outcompeting their own children in Arts, Science and Commerce degrees the rich families established business schools to bundle them out in the labour market with an attractive outlook. The effective access of other students, to these schools, of course, has been very limited.

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[8] Here is one excellent example of institutional rigidity which affects the opportunity cost of sending children to school among the lowest-income farming groups. The vacations in the schools are not well synchronized either with the need to have the children of the small cultivators and landless labourers on the farm during harvests, thus contributing to drop-outs and low enrolments of such children from schools.

The elite groups exert their influence even more perceptibly in the job markets to improve their economic well-being. Several features of the discrimination surface in the hiring practices of public as well as private organizations. The criteria 'who knows whom', 'who pays (in money or in kind) what,' and the like ones work to keep out the competent candidates to the advantage of those from the privileged and upper-class families.

Discrimination in the labour market (as elsewhere) is exercised by establishing inter-dependency patterns and communication networks between the concerned parties which require the investment of financial and/or social capital. The upper-class families, endowed handsomely with financial as well as social capital, can readily tilt the distribution of labour market benefits in their favour. And the employers (selection committees) of public and semi-public organizations, where management is usually detached from ownership, have pecuniary and/or non-pecuniary temptations and little deterrence, if any, to comply with the elite groups. In fact, personal interviews of candidates are, more often than not, arranged to put up a show of 'fairness' and 'competitive selections' as well as to ensure desired but discriminatory selection in covert, legally impeccable manner. Even the stubbornly profit-maximizing private employer will not allocate workers to job slots by a simple matching of technically defined skills with technically defined production requirements. The worker attributes which are valued by employers are not limited to academic qualifications, technical skills, or other productive capacities, but also extend to such work-relevant personality traits as dependability, docility, punctuality, discipline, orientation to the enterprise, etc., and also to such ascriptive attributes as family, caste, domicile, sex, age, etc Profits (the difference between the value of the average product of labour and the value of the labour power or the wage) on a given stock of money capital are maximized by capitalists through extracting labour from workers to the fullest extent and at the lowest possible wage. Labour costs are minimized by keeping the labour bargaining power weak. Such work-irrelevant attributes as caste, race, sex, ethnicity, age and domicile are used by the employer to fragment the work force and prevent or sabotage worker coalitions. The value of the average product of labour, on the other hand, is maximized by increasing the labour power (workers' physical-mental capacities and skills, behavioural characteristics, and potential impact on the performance of other involved in cooperative production) through a selection of a worker who possesses better academic-technical qualifications and other work-relevant personality traits and at the same time poses no potential threat to the smooth functioning of existing incentive-control mechanism of the firm. It is because of his/her need to generate or select individual motivational patterns more compatible with the existing power structure and control-incentive mechanism of the enterprises the employer falls on consideration of ascriptive worker attributes and the employees come to play a significant role in the distribution of job-slots. If a particular group (based on caste, sex, age, religion, domicile, wealth, etc.) of workers is dominant and follows a discriminatory policy favouring its group member in filling job vacancies the employer will have pecuniary incentives to give preferences to the members of that group. To achieve their economic gains the members of the dominant group may employ variety of tactics ranging from coaxing to cost-raising actions such as non-cooperative attitudes with the members of other groups, slowdowns, strikes, etc. To the extent these tactics of the dominant group affect profitability the employer has the pecuniary incentives to allocate labour market benefits in favour of that group. So long as the workers of the other groups lack the retaliatory power the employer and the dominant group of workers can be expected to agree on a settlement which automatically fixes the weaker groups into a subordinate position. For a variety of reasons the cooperation between the employer and the dominant group workers is likely to be a stable arrangement for conducting discrimination against other workers. The victims of labour market discrimination in many instances may remain unaware of it. Even if they suspect or become aware of it, it is no easy task to prove its existence and illegality. Scattered, fragmented, inarticulate, and passive as they are likely to be the employer faces no threat of group action by them and has no incentive to defy the interests of the dominant group workers.[9] And wage-competition can hardly be a force to count on in changing the situation Widespread bureaucratic procedures and governmental wage-fixing regulation limit its use. Wage-advantage may even fall short of cost-disadvantage risked by the employer in hiring a worker opposed to the dominant group workers. Moreover, in a situation where competition really is for jobs rather than earnings wage-competition remains an impotent force. In absence of spectacular change in the relative ability of the dominant and non-dominant groups to affect profitability of production there is little reason to expect from the present functioning of the labour market any change in the discriminatory solution. Fundamental change in the relative economic power (which really flows from the relative class-positions) of the competing groups or government intervention is essential for that purpose. But that again depends on the capabilities of the weaker groups to undertake social and political actions.

The power position that is sometimes exploited by a candidate to obtain a job may be the external one : that of a minister, a member of the parliament (legislature, assembly, municipal corporation), businessmen, or a superior official. The employer yields to such recommendations simply because he/she expects a real quid-pro-quo in terms of a scarce, premium-fetching licence or a 'good' business favour. In any case, it compels the employer for one or the other reason to give a job to the candidate who holds the extra-professional and work-irrelevant credential.

It is simply a matter of general observation to find out that extra-professional qualifications—especially kinship ties, linguistic-community affinities, financial offers (donations, bribe, etc.), and political pressures—provide a candidate a 'push' which makes decisive difference in appointments all over in the Indian labour-market. Sons and relatives of businessmen, politicians, and administrators are appointed at lucrative managerial and administrative positions in their "own" or "friends" companies. Recruitment of staff in other public and private institutions also takes place on similar extra-professional basis. Appointments in the public institutions are made according to government rules, but ways to circumvent the rules are found with no difficulty to fulfil the interest of the members of the management.[10] The power position that is exploited to make a gain for self, family, or community may be the one of a minister, a member of the legislature, a superior government officer, or a close relative of the employer, and an employee of the organization. Dominant in most of the organizations and endowed more favourably with both financial and social capital the privileged class naturally reaps the greatest benefits from the employment market.

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[9] This is really a case of prohibitive 'transaction cost'. As Jawaharlal Nehru once said : 'The really poor never strikes. They haven't the means or power to demonstrate.' Long before Marx also complained about the contendedness and lack of demands of the poor. Some of them succeed in accomplishing influential posts but they soon become a part of interest groups

Lower and middle-income groups, on the other hand, face enormous difficulties in finding jobs in a job-scarce situation and usually turn to acquire steadily more degrees—M.A., LL.B., Ph.D., etc. in the hope of improving their chances in landing on one or the other job. The phenomenon of 'over-qualification' is thus expected to be the most evident among these groups. Despite financial difficulties they continue to pursue 'higher-higher' education in the hope of improving job access, since employment is the only source of income for many of these families.

In sum, relative power position enter rather fundamentally in determining the distribution of income among different socio-economic groups. Elite groups, on the strength of their greater power clout, reap disproportionately large benefits from both the state subsidized educational programme and employment market. At the very first stage the inegalitarian economic and social stratification exerts its influence on the pattern of educational expenditure so as to shape the school system which caters more to the interests of upper classes. It is again the elite classes that benefit more from the existing educational system (which, in principle, is open to all) as they are better equipped, financially and otherwise, to gain 'access' to the most favoured and prestigious schools. Such discrimination against the lower income groups is imbedded in the inegalitarian economic regime itself. In the employment market they manage to strike a settlement with employers which hands out disproportionately large benefits of different job-slots to the elite group workers and automatically fixes the weaker groups into subordinate position. Discrimination in the labour market is conducted systematically by bribing or threatening the employer (with the help of political, social and financial resources) to take care of elite group's interests. The relevance of power and class-structure is thus substantial at all stages of investment in human capital and the valuation of individual attributes in the labour market. The weaker groups are persistently subordinated : their poverty itself becomes the cause of the difficulty they face in rising out of the poverty. A part of this gets reflected in the data relating to various socio-economic groups on the kind and extent of schooling done, unemployment rates, occupational distribution, employment earnings and pattern of job search.

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[10] A study by Madan and Halbar (1972) on the composition of staff of private teaching institutions in Mysore (now Karnataka) State of India revealed that the teaching staff was dominated by the managing community itself. The data on heads of institutions and with regard to key administrative posts such as superintendent, accountant, and head clerk also conformed to the same pattern. The usual justification offered for the policy of the management to favour its community or caste in the appointments of teachers and other staff is that people with common interests and aims contribute to harmony and that such a community of interests is natural among members of the same caste. It should be noted further that only the economically powerful or socially advanced communities have been able to operate effectively the educational institutions.

The theoretical model described in the present paper seems to be remarkably comprehensive and capable of providing compelling explanation of the pattern of educational expenditure, the distribution of benefits of educational expansion and labour market slots among various socio-economic groups, greater educated unemployment and underemployment among weaker group workers, relatively lower rate of return to human capital formation accruing to the lower and lower-middle income groups, repressive effect of educational expansion on the income equality, and the dynamic behaviour of various socio-economic groups with respect to job-search and educational investment, and the perpetual economic subordination of the weaker groups.

A question may be raised, however, about the empirical status of the model presented here. Clearly, our model leads to the formulation of hypotheses in a rather different form which may not readily permit the use of sophisticated mathematical and statistical techniques. Also, they may not be empirically testable with available quantitative information. They may have to be confronted against the economic, social, historical, cultural, and political facts. Different kinds of empirical evidence, therefore, may need to be collected, through suitably designed surveys, and analysed. The surveys may involve some financial burden but are likely to pay off handsomely. In time, they certainly would mark a turning point to a richer, more comprehensive, and socially more relevant and meaningful view of the issues under study. They, in all probability, would save the researchers and policy-makers from the distorted, and very often even a perverse, view emerging from their narrow economic analysis of the real world issues.

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Indian Norms of the Minnesota Teacher Attitude Inventory

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This study attempts to find out the norms of the adapted form of the MTAI. Only the percentile norms have been established for the various groups of trained graduate teachers on the basis of sex, place of posting, type of institutions as well as age and amount of experience. The study found that the male teachers have higher mean scores as measured by this inventory than the female teachers, whether they were working in the government urban or rural schools or in the private schools. The length of teaching experience and age were not significantly related to teacher attitude as measured on the adapted form of the MTAI.

THE MINNESOTA TEACHER ATTITUDE INVENTORY (Cook, Leeds and Callis 1951) has been considered a very popular instrument for the measurement of teacher attitudes. The MTAI is a 150-item inventory which purports to measure the degree to which teachers and student-teachers have a child-centred attitude in contrast to a technique-centred attitude as related to classroom behaviour. It has been used in a number of studies to measure 'good' attitudes of teachers and student-teachers towards teaching and children. It was designed to measure those attitudes of a teacher which predict how well he will get along with pupils in inter-personal relationships and indirectly how well satisfied he will be with teaching as a vocation. These attitudes offer a key to the prediction of the type of social atmosphere a teacher will maintain in the classroom.

The MTAI is a useful instrument and is utilized to appraise the teacher's

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Paper presented at the 14th Annual Conference of the Indian Academy of Applied Psychology held at IIT, Kharagpur, from 27 to 29 December 1976 ability to maintain harmonious relationships with children in the classrooms. Research over a number of years has shown that this instrument is capable of differentiating between teachers who get along well with pupils in interpersonal classroom relationships and those who do not. Attitudes of teachers towards children are closely associated with teacher-pupil relationships found in the classroom. So the MTAI is an inventory of teacher's attitude characterizing mutual affection and sympathetic understanding between teachers and pupils.

But this inventory which was standardized under American conditions cannot be used in India. Some questions might be raised concerning the representativeness of the norms for the MTAI for Indian conditions, since the original norms were based on the University of Minnesota students and the norms of the groups in other studies conducted in other western countries obtained scores which were significantly different from the means of the original norms. It may be stated here that to be useful in other countries, the MTAI has to be re-standardized and new norms need to be established. All those who have used the MTAI in India agree that the American norms are not applicable here and it is also probable that some re-wording of items would be desirable. With this main objective in mind, the present study was undertaken which aims at establishing percentile norms for the trained graduate teachers. The male and female teachers, rural and urban teachers, teachers of government and non-government (private) institutions, teachers of different age levels as well as for teachers with different amount of teaching experience.

Method and Procedure

Sample

The total sample of this study consisted of 1,081 trained graduate and postgraduate teachers, both male and female, from the urban and rural schools and working in the government as well as non-government institutions located in five districts of the Punjab. The distribution of the sample with respect to sex, place of posting and type of institution is given in Table 1.

Table 1 shows that out of the total Ss, about 59 per cent were male teachers (639) and 41 per cent female teachers (442); 77.5 per cent of the Ss were working in the Government schools whereas only 22.5 per cent of Ss were found to be working in the private schools and 67 per cent of the teachers out of the total sample were teaching in the urban schools (725) and 33 per cent in the rural schools (356).

TABLE 1

DISTRIBUTION OF THE SAMPLE WITH RESPECT TO SEX, PLACE OF POSTING AND TYPE OF INSTITUTION

Type of Institution	*Urban Schools*		*Rural Schools*		*Total*
	Male	*Female*	*Male*	*Female*	
	Teachers		*Teachers*		
Govt schools	235	246	260	96	837
Private schools	144	100	—	—	244
Total	379	346	260	96	1081

Procedure

The adapted form of the MTAI (Singh 1975) which consists of 100 statements was administered to the graduate and postgraduate teachers of the high/higher secondary schools by the investigator by contacting them in their respective schools either through the Heads of the institutions or directly, sometimes in groups and at other times individually, in their free periods, and in some of the cases through correspondence. After collecting the response-sheets from the teachers, they were scored by the 'right' and 'wrong' scoring-keys prepared on the basis of the original scoring procedure given in the manual of the original MTAI.

Adapted Form of the MTAI

The original test of the MTAI was translated itemwise into Punjabi language and got vetted by three language experts and two educationists. It was administered to 616 trained graduate teachers belonging to different schools in the Punjab. For the purpose of item-analysis, a sample of 186 Ss was selected out of the total sample randomly giving proportionate representation to six categories of teachers. The item-analysis was done by two procedures : (*i*) Mean score difference method and (*ii*) Biserial correlation method. The inconsistent items or statements which have less discriminative values were eliminated. Out of 150 items, 100 items were selected for the adapted form of the MTAI. The reliability coefficient was calculated by the split-half method corrected by the Spearman-Brown prophecy formula and the test-retest method which were found to be .86 and .78, respectively.

Results and Discussion

After scoring of the response-sheets of the inventory was completed, the means, SDs and other statistical measures of the scores of the adapted form of the MTAI were found out for the various groups formed on the basis of sex, place of posting and type of institutions as well as on the basis of age and amount of teaching experience of the teachers. Moreover, the percentile norms have been established in the present study, as were done by the authors of the original test. Since the trait under study is not known to show a progressive change with age or grade, age/grade norms have not been established. Tables 2, 3 and 4 show percentile norms as well as means and SDs for the scores on the adapted form of the MTAI for the trained graduate teachers on the basis of sex, place of posting, type of institution as well as on the basis of age and amount of experience.

TABLE 2

PERCENTILE NORMS, M AND SD FOR THE SCORES ON MTAI ON THE BASIS OF SEX, PLACE OF POSTING AND TYPE OF INSTITUTION

Percentile	*Urban Teachers*		*Rural Teachers*		*Private Teachers*		*Total group*
	Male	*Female*	*Male*	*Female*	*Male*	*Female*	
P99	46	25	31	30	38	30	23
P95	24	0	10	10	13	— 1	12
P90	10	—10	4	—1	4	— 7	3
P80	—4	—17	—5	—16	— 8	—17	—10
P75	—11	—22	— 9	—22	—12	—22	—14
P70	—14	—26	—13	—25	—15	—25	—18
P60	—21	—33	—19	—31	—20	—30	—25
P50	—28	—38	—25	—35	—25	—34	—31
P40	—34	—42	—31	—39	—29	—37	—36
P30	—39	—47	—37	—45	—34	—43	—41
P25	—42	—49	—40	—48	—38	—45	—44
P20	—45	—53	—43	—51	—41	—48	—47
P10	—53	—60	—50	—59	—48	—55	—55
P5	—60	—67	—57	—64	—53	—61	—60
P1	—70	—73	—65	—71	—69	—71	—72
N	235	246	260	96	144	100	1081
M	—24.31	—34.65	—23.96	—32.58	—23.35	—32 1	—27 91
SD	24.80	22.10	—20.90	21.70	20.70	19 50	22.50

Table 2 makes it clear that the scores of the total group are positive only at the 90th percentile and above. As reported by the authors of the original MTAI in the manual, the positive scores were obtained at all levels above the 30th percentile. Stein and Hardy (1957) have also reported the positive scores for secondary school teachers at the 50th percentile and above. It is clear from these norms that teachers in the western countries have more favourable attitude towards pupils as compared to the teacher in India. This may be due to the fundamental differences in the educational systems prevailing in the western countries and India. Leeds (1951) also noted a tendency for foreign-born teachers to score somewhat lower than Americans.

It is also clear from Table 2 that in case of all categories of teachers working in the urban, rural and private schools, there are consistent differences between the male and female teachers; the males in almost all cases having higher score at each percentile level than the females Comparing the differences of the percentile norms between male and female teachers working in the urban and rural schools, this table also shows that at 90th percentile and above, the superiority of urban male over the urban female is more marked than the superiority of rural male over the rural females, which means that urban male teachers falling in those percentiles have more favourable attitude towards pupils than the urban female as well as rural male and female teachers. At the 80th percentile and below, the difference between the male and female Ss is approximately the same for urban and rural teachers It is clear that the scores at the 80th percentile and above in case of urban males are higher than those of rural males, but the reverse is true at all percentile levels below the 80th percentile.

It is very interesting to note that the rural female Ss have higher score than urban female Ss at almost all percentile levels, however, the difference between the rural and urban female Ss is more at the upper three percentile levels. Table 2 also indicates that at the 70th percentile and above, male teachers working in government schools (urban) have higher scores than male teachers working in private schools, whereas at all other percentile levels, i.e. P60 and below, the reverse is true. In case of female, Ss working in the private schools have higher scores than those working in the government school at 70th percentile and below.

A comparison of the means of different categories of teachers grouped on the basis of sex, place of posting (urban and rural) and type of institution (government and private) shows that in all cases, means in respect of males are higher than that of the female Ss. These results of the study are in contradiction with those of the findings of Sandgren and Schmidt (1956), Beamer and Ledbetter (1957), Fisherman (1957), who found that the famale teachers have higher mean scores than the male teachers. But the results of the present study are in agreement with those of a study on the Punjab population by Jindal (1972), who also found that the means in case of male Ss are higher than those of the female Ss. The present study revealed that means in respect of rural teachers are higher as compared to the urban teachers whereas the means in respect of the private school teachers are higher than those of the government school teachers.

TABLE 3

PERCENTILE NORMS FOR THE SCORES ON MTAI ON THE BASIS OF AGE

Pecentile	*Age*				
	Less than 26 years	*26-30 years*	*31-35 years*	*36-40 years*	*Above 40 years*
P99	34	28	27	48	34
P95	9	9	8	26	12
P90	2	2	2	8	1
P80	-12	—10	—11	— 6	—11
P75	—16	—14	—15	—11	—15
P70	—21	—19	—19	—14	—20
P60	—28	—24	—26	—20	—26
P50	—33	—29	—32	—26	—31
P40	—37	—34	—38	—33	—35
P30	—42	—39	—43	—41	—39
P25	—44	—42	—46	—44	—42
P20	—47	—45	—48	—47	—45
P10	—55	—53	—53	—55	—52
P5	—63	—60	—63	—60	—60
P1	—76	—70	—71	—78	—68
N	208	242	288	236	107
M	—28.87	—27.49	—29 67	—24.69	—27.93
SD	21.10	21 20	22.00	25.46	21 00

Table 3 indicates at the 80th percentile and below, teachers between 26-30 years have higher scores on the adapted form of MTAI than teachers who are either less than 26 years or between 31-35 years. It is also interesting to note that at the 40th percentile and above, teachers between 36-40 year have more scores than teachers in all other age-groups. It may be added here that the teachers in the age-group of above 40 years have almost consistently higher scores than those teachers who are less than 26

It is clear from Table 3 that the mean scores with reference to age show a very peculiar trend, the highest mean score being for the age-group of 36-40 years and the lowest being for the age-group of 31-35 years. It may be mentioned here that Leeds (1950) found a significant negative relationship between inventory scores and age. Fisherman (1957) also found that age was not significantly related to scores in the normifying population.

TABLE 4

PERCENTILE NORMS FOR SCORES ON MTAI ON THE BASIS OF AMOUNT OF TEACHING EXPERIENCE

Percentile	*Age*				
	Less than 1 year	*1-5 years*	*6-10 years*	*11-15 years*	*Above 15 years*
P99	19	31	26	29	44
P95	14	7	7	14	29
P90	7	— 2	1	4	9
P80	— 7	—14	— 9	— 9	— 4
P75	—12	—19	—14	—14	—11
P70	—15	—22	—18	—18	—14
P60	—23	—28	—24	—25	—21
P50	—31	—33	—29	—32	—28
P40	—36	—37	—36	—38	—33
P30	—41	—41	—42	—43	—38
P25	—44	—44	—45	—46	—40
P20	—46	—48	— 47	—48	—44
P10	—53	—56	—55	—56	—53
P5	—59	—63	—61	—60	—59
P1	—70	—79	—73	—70	—69
N	104	257	304	211	205
M	—26.94	—30.68	—28.49	—28.84	—23.60
SD	22.30	20.70	21 30	22.50	25.00

As it is clear from Table 4, at all the percentile levels, teachers having an experience of more than 15 years have higher scores than those with experience less than 15 years. It is very interesting to note that at all percentile levels except P99, teachers with less than one year's experience have higher scores than those having experience between 1-15 years, though the differences are very minute in some cases. The above discussion makes it very clear that teachers having experience of more than 15 years have more favourable attitude towards children than all other teachers; next in order are those teachers having less than one year of teaching experience.

Table 4 indicates that the teachers with teaching experience of either up to one year or above 15 years have less negative attitude towards pupils than those having an experience between 1-5 years. Callis (1950) and Rabinowitz and Rosenbaum (1960) noted a significant downward trend in attitude scores among graduates after six months of teaching and concluded that scores on the inventory to be negatively correlated with length of teaching experience Cook and Hoyt (1952); Cook, Hoyt and Fikas (1956), however, found that scores on the MTAI were unrelated to the length of teaching experience. Sandgren and Schmidt (1956) showed that experience decreased MTAI scores. Beamer and Ledbetter (1957) found that in the secondary school group, teachers with one year of experience had the highest mean score and the teachers with 2 to 5 years' experience the lowest Stein and Hardy (1957) in their study concluded that the MTAI scores were unaffected by age or teaching experience. The results of the present study reveal that in the case of teachers with more than 15 years' teaching experience, the mean score is the highest and the teachers with 1-5 years' teaching experience the lowest. But there is no other relationship between teaching experience and the teaching attitudes.

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The Effect of Schedules of Reinforcement and Extroversion on Programmed Instruction Achievement

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THE EDUCATORS are primarily concerned with changing or strengthening behaviour, it seems natural that much of the discussion about behaviour modification is focused on reinforcement. Reinforcement by definition, refers to any environmental event that increases the probability of a response.

The consequences of an individual's actions are critical in the modification and maintenance of behaviour. Behaviour is acquired or modified under conditions in which a response produces a consequent stimulus event (such as reward) that strengthens or maintains that response. The stimulus event which the response produces is referred to as a 'reinforcer' or 'reinforcing stimulus'. The occurrence of a reinforcer as a consequence of behaviour is called reinforcement.

Extroversion is a dimension of personality which is normally distributed. The most people are around average, while others can be placed towards one extreme or the other. Introvert people tend to be conscientious, persistent and able to carry out repetitive task, acquire conditioned responses readily, and are also slow to lose them. Extroverts on the other hand are more easily distractable, quickly find repetitive task boring, like variety of conditions poorly and lose conditioned responses quite quickly. There is also difference in outgoingness and sociability. These and other differences have been explored by Eysenck (1965) and Cattle (1965), the characteristics outlined seeming, perhaps, to account for the academic superiority of introverts.

Problem

The studies conducted so far reveal that the effect of extroversion on programmed instruction achievement and intermittent reinforcement have been designed either singly or in combination with some other variables such as methods of programming, prompting, etc. But the present investigator is interested to study the interaction effects between schedulers of reinforcement and extroversion on programmed strategy achievement. An attempt has been made at the research design to seek the answer of the following question :

> Is there significant interaction between schedules of reinforcement and extroversion in programmed instruction achievement ?

Objectives

The following were the main objectives of this study :

(*a*) To analyse the interaction effect of schedules of reinforcement and extroversion/neuroticism on achievement.
(*b*) To evaluate the effect of various schedules of reinforcement on student achievement.
(*c*) To examine the difference of achievement between extrovert and introvert pupils.
(*d*) To ascertain the difference between neurotic and stable pupils with regard to their achievement.

Hypotheses

Under the plan and procedure of the study the following hypotheses have been formulated and tested :

(*i*) There is significant interaction between schedules of reinforcement and extroversion of pupils with regard to their achievement.
(*ii*) The extrovert and introvert pupils differ significantly for achievement on continuous reinforcement schedule.
(*iii*) The extroverts' performance is significantly higher than introverts through intermittent reinforcement schedule in programmed strategy.
(*iv*) The various schedules of reinforcement produce difference in performances.

(*v*) There is significant difference of achievement between neurotics and stable pupils.

Design of the Study

The experimental method was used for conducting the investigation. In this experiment 3×2×2 factorial design of independent measures was employed for studying the interaction effect between schedules of reinforcement and extroversion/neuroticism on achievement. In the combined experiments 3×4×2 factorial design was followed : three schedules of reinforcement, four dimensions of personality and two for boys and girls as sex variable

The stratified sampling technique was used. D.N. Inter College, Meerut and S S D. Girls Inter College, Meerut, were taken up for extroversion experiments The Eysenck's Maudsley Personality Inventory, Hindi version adapted by Jalota and Kapoor, was administered on Class XI in both the institutions. The raw scores on MPI were converted in standard scores. Thus, frequency distribution of MPI scores for 300 boys and 300 girls were prepared. The normalcy of these distributions were tested with the help of Chi-square test. The Chi-square test suggested that these distributions are approximately normal. The extroverts and introverts were selected by using 27 per cent top and 27 per cent bottom Kelly's dichotomy.

A similar procedure was followed for the neuroticism experiment which was conducted in J.V. Jain Inter College and J.B.S. Girls College of Saharanpur city. The neurotic and stable boys and girls were identified on the basis of their distribution of standard score obtained for neuroticism scale. In each group 300 subjects were taken up Thus, 81 neurotics and 81 stable boys and girls were selected separately from these distributions

After identifying the extrovert and introvert boys and girls, the first experiment was conducted in Meerut on boys and girls regularly for eight days from 23 July 1976 to 11 August 1976. Three schedules of reinforcement : continuous, intermittent and no reinforcement schedule were used as treatments in the experiment. In each treatment 27 extroverts and 27 introverts were assigned. Prior to the treatment criterion test was administered as pre-test to measure the initial learning on Alankar. These treatments were given with the help of linear programming developed by the investigator on Hindi Alankar. At the end of the treatment, same criterion test was administered as post-test.

The second experiment was also conducted for neuroticism dimension of personality on similar lines. Thus, the obtained data of the second experiment were analysed separately and also by combining the data of both the experiments to have comprehensive results.

Discussion

The obtained results have been reported in the following parts.

1. *Extroversion*

The obtained data for the first experiment were analysed and the results have been summarized in Table 1.

TABLE 1

ANALYSIS VARIANCE TABLE

Sources	*df*	*S S.*	*M.S.*	'F'
A. Reinforcement	2	7660.76	3830.38	264.89
B. Extroversion	1	393.36	393.36	27 20
C. Sex	1	1.63	1.63	0.11
A×B Reinf.×Extro.	2	1716.97	858.48	59 36
B×C Extro. × Sex	1	21.27	21.27	1.47
A×C Reinf. × Sex	2	33.88	16.94	1.17
A×B×C Reinf. × Extro. × Sex	2	15.27	7.63	0.52
Error between cells	11	9843.14	894.83	—
Within cells	312	4513.12	14 46	—
Total	323	14356 26	—	—

Table 1 indicates that F-value for schedules of reinforcement (A) was found to be 264.89 with degrees of freedom 2 and 312. It was significant even at .01 level of significance. It may be interpreted that the difference among schedules of reinforcement appears highly significant. It may be noted from Table 1 that F-value for extroversion (B) was obtained to be 27.20 with degrees of freedom 1 and 312. The F-value was significant at both the levels of confidence. It may be stated that the difference between extroverts and introverts seems to be highly significant The mean value of extroverts was 32.92 and introverts 30.71. On the basis of these statistics it may be further interpreted that the extroverts appear to have higher achievement than the introverts.

It may also be observed from Table 1 that the F-value for Sex (C) was reported to be 0.11 with degrees of freedom 1 and 312. It was not significant even at .05 level of significance. It may be said that boys and girls seem to have equal achievement. Table 1 also reveals that F-value for interaction effect of A×B was found to be 59.36, with degrees of freedom 2 and 312, The F-value was significant even at point .01 level of confidence. It may, therefore, be stated that the interaction between schedules of reinforcement (A) and extroversion (B) appears to be highly significant. It may also be seen from Table 1 that F-value for interaction effect of B and C was obtained to be 1.47 with 1 and 312 degrees of freedom. It was not significant at any level of confidence. It may be interpreted that there is no interaction between extroversion (B) and sex (C) factors.

It may be further noted from Table 1 that F-value for interaction effect of A and C was 1.17 with 2 and 312 degrees of freedom. The F-value was not significant even at .05 level of confidence. It may, thus, be interpreted that there is no interaction between schedules of reinforcement (A) and sex (C). Table 1 also suggests that F-value for interaction effect of A×B×C was found to be 0 52 with 2 and 312 degrees of freedom. It was not significant even at .05 level of significance. It may be stated that there is no significant interaction among schedules of reinforcement (A), extroversion (B) and sex (C).

The F-test was followed by t-test to specify the significance of main effects and interaction effects. The t-value for the difference between continuous and intermittent schedule was found to be 1.659 with 214 degrees of freedom. It may be stated that continuous and intermittent schedules of reinforcement seem to be equally effective. The continuous and intermittent schedules appear to be highly effective than the no reinforcement schedule. The t-test was followed for locating the significant interaction A×B. The t-value suggests that continuous reinforcement schedule is effective for introverts whereas intermittent schedule is effective for extroverts.

2. *Neuroticism*

The data of the second experiment were analysed on similar lines and the obtained results have been provided in Table 2.

Table 2 presents that F-value for the main effect of schedules of reinforcement (A) was 363.78 with 2 and 312 degrees of freedom. The F-value was significant even at .01 level of confidence. It may, therefore, be stated that

TABLE 2

ANALYSIS VARIANCE TABLE

Sources	*df*	*S.S.*	*M.S.*	'F'
A. Reinforcement	2	5580 47	2790.23	363 78**
B. Neuroticism	1	300.44	300 44	39.17**
C. Sex	1	2.42	2 42	0 31
A×B Reinf. × Neuro.	2	1473.37	736 68	96 04**
B×C Neuro. × Sex	1	1.00	1.00	0.13
C×A Sex × Reinforcement	2	16 87	8.43	1 09
A×B×C Reinf × Neuro. × Sex	2	6 60	3.30	0.43
Between cells	11	7381 17	671.01	87.48**
Error within cells	312	2395.30	7.67	—
Total	323	9776.47	—	—

the difference among schedules of reinforcement seems to be highly significant. It may be observed from Table 2 that F-value for the neuroticism's main effect was found to be 39.17 with 1 and 312 degrees of freedom. It was significant at both the levels of significance. The result suggests that there may be a significant difference between neurotics and stables with regard to their achievement. It may be noted from Table 2 that the F-value for sex (C) main effect was found to be 0.31 with 1 and 312 degrees of freedom. The F-value was not significant at any level of confidence. It may be stated that there is no difference between boys' and girls' achievements. Table 2 also shows the F-value for the interaction of A × B was recorded to be 96.04 with 2 and 312 degrees of freedom. The F-value was significant at both the levels of confidence. It may, therefore, be interpreted that the interaction between schedules of reinforcement (A) and neuroticism (B) appears to be highly significant.

Table 2 also indicates that the F-value for interaction effect of B×C was 0.13 with 1 and 312 degrees of freedom. It was not significant even at .05 level of confidence. It may be said that there is no interaction between neuroticism (B) and sex (C) factors.

It may be gathered from Table 2 that the F-value for interaction of A×C was found to be 1 09, with 2 and 312 degrees of freedom. It was not significant even at .05 level of significance. It shows that there is no interaction between schedules of reinforcement (A) and sex (C) factors. Table 2 also reveals that F-value for the interaction of A×B×C was obtained to be 0.43 with 2 and 312 degrees of freedom. The F-value was not significant at any level of confidence. It may be stated that there is no significant interaction among schedules of reinforcement (A), neuroticism (B) and sex (C) factors. The F-test was followed by the t-test. The t-value for the difference between continuous and intermittent reinforcement was obtained to be 1.298 with 214 degrees of freedom. It was not significant at any level of significance. It may be interpreted that continuous and intermittent reinforcement appears to be equally effective The other t-values indicated that continuous and intermittent seem to be highly effective than no reinforcement schedule.

The t-value for the interaction A×B suggests that continuous reinforcement is effective for stables where as intermittent appears to be effective for neurotics.

3. *Personality*

The data of both the experiments were combined and 3×4×2 factorial analysis was attempted to obtain more comprehensive results. Thus, the data were reorganized in 24 cells and the results of the analysis have been recorded in Table 3.

TABLE 3

ANALYSIS VARIANCE TABLE FOR 3×4×2 FACTORIAL DESIGN

Source	*df*	*S S.*	*M S.*	*'F'*
A. Reinforcement	2	13155.67	6577.83	594 20**
B. Personality dimension	3	694.07	231.35	20 89**
C. Sex	1	4.01	4.01	0.36
A×B Reinf. × Personality	6	3275.89	345 98	59 32**
B×C Personality × Sex	3	22.30	7.43	0.67
A×C Reinf. ×Sex	2	47.41	23.70	2.14
A×B×C Reinf. × Person. × Sex	6	25.23	4.20	0 37
Between cells	23	17224 58	748 89	—
Within cells	624	6908 41	11.07	—
Total	647	24132.99	—	—

Table 3 indicates F-values for three main effects, three interaction effects of two factors and one interaction effect of three factors. The F-value for the main effect of schedules of reinforcement (A) was found to be 594.20 with 2 and 624 degrees of freedom. The F-value was significant at .01 level of confidence. It may be interpreted that difference among schedules of reinforcement seems to be highly significant. The F-value for the main effect of personality dimensions were recorded to be 20.89 with the degrees of freedom 3 and 624. It was significant at both the levels of confidence. It may be stated that there is significant difference among personality dimensions. Table 3 shows that main effect of sex factor was found to be 0.36 with 1 and 624 degrees of freedom. It was not significant even at .05 level of confidence. It shows that there is no significant dffeience between boys' and girls' performance.

Table 3 also reveals that F-value for interaction effect A × B (schedules of reinforcement × personality dimension) was obtained to be 49.32 with 6 and 624 degrees of freedom. It was significant at .01 level of confidence. It may be interpreted that there is significant interaction between reinforcement (A) and personality (B). It may be further observed from Table 3 that interaction effect between schedules of reinforcement (A) and sex (C) factors was 0.67 with 3 and 624 degrees of freedom. It was not significant at any level of confidence. It may be said that there is no interaction between reinforcement (A) and sex factor (C). Table 3 also indicates that interaction effect between personality dimension (B) and sex factor (C) was noted 2.14, it was not significant even at .05 level of confidence. It may be stated that there is no significant interaction between personality dimension (B) and sex (C) factors.

Table 3 reveals that the F-value for the interaction among A × B × C was obtained to be 0.37 with the degrees of freedom 6 and 624. It was not significant at any level of confidence. It may be said that there is no significant interaction among schedules of reinforcement (A), personality dimensions (B) and sex (C) factors. The t-values for the main effects suggest that continuous reinforcement seems to be more effective than intermittent and no reinforcement schedules. The intermittent reinforcement appears to be highly effective than no reinforcement schedule. The t-values for the personality dimension suggest that extroverts and stables seem to learn better than introverts and neurotics.

It may be stated that extroverts and neurotics learn higher through intermittent schedules of reinforcement whereas introverts and stables perform higher through continuous reinforcement.

Findings

In view of the foregoing discussion of results, the following formulations appear to be tenable :

i. It appears that continuous and intermittent schedules of reinforcement are equally effective.
ii. The continuous and intermittent schedules of reinforcement seem to have higher achievement than no reinforcement schedules.
iii. It seems that extroverts' performance is significantly higher than the introverts' through intermittent reinforcement schedule.
iv. It also appears that extroverts' and stables' performance is higher than introverts and neurotics.
v. It appears that introverts' achievement is significantly higher than the extroverts' through continuous reinforcement.
vi. The performance of stables seems to be significantly greater than neurotics through continuous reinforcement.
vii. It seems that there is no interaction between schedules of reinforcement and sex factors.
viii. The schedule of reinforcement, extroversions and sex factor may not interact significantly.
ix. It seems that neurotics' achievement is higher than the stables' through intermittent schedule of reinforcement. On the other hand, stables' performance is significantly better than neurotics through continuous schedule of reinforcement.
x. There is no significant interaction among schedules of reinforcement, neuroticism and sex variables jointly.
xi. It seems that there is no interaction between neuroticism and sex factor.

Implications

The findings of the interaction may be considered to give support to the view that success of extroverts, introverts, neurotics and stables in school type learning situations is related to the schedules of reinforcement employed. The inferences of the investigation provide the possibility for developing schedule of reinforcement for different kinds of pupils. The findings of the study provide the basis for educational guidance for under-achievers. The suitable schedule of reinforcement may be suggested for different kinds of pupils.

The classroom teacher can also make use of the findings of the study for dealing with the classroom problems of various types of students. The inferences of the present experimentation provide the empirical basis to the programmers to make provision of various schedules of reinforcement in their instructional material so that every kind of pupils may be equally benefitted.

It is the hope of the investigator that the findings of the study may contribute for developing and effective strategy of teaching and learning of different kinds of students.

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Educational Research in South-East Asia

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DESPITE VAST DISPARITIES in the socio-economic backgrounds of the countries in the south-east Asian region a few areas of equal concern attract attention. One such area is educational research. Educational research *per se* has very restricted significance and may interest a few individual scholars only whose motivations might lie deep within themselves. Research like all educational endeavours has social relevance for the simple reason it seeks to explore causal relationships between the norm and its deviation; between the practice and the ideal, between the *is* and *ought*. By implication research focuses its attention on the nature of the existing problems and suggests *possible* ways and means of resolving them. Diagnosis of the malaise is surely not its remedy. Remedies are chosen from a whole range of medicines that are available to an expert medical practitioner. The correct choice is likely to result in cure. This analogy is deliberate and reflects the nature of educational research and the underlying concepts behind the same.

In all these countries people seem to have realized that research for the sake of research is an activity in vacuum and, therefore, need hardly be supported through public money. The only research which deserves public support is the one whose results promise applicability. Such research has either to be diagnostic or of the intervention type whereby alternatives would be made available to the planner and/or administrator to pick and choose. Here research, therefore, has to be goal-oriented. It must perform a specific function. What is termed as basic research had its own role deserved consideration.

The Desirability of Educational Research

On the point whether or not educational research be funded, there are no two opinions. The government of this region would, however, appreciate if reforms in education were the consequence of some research. In other words people want to see a direct cause and effect relationship between research and reform. While they acknowledge that all research cannot yield solutions and neither can existing problems await infinitely for research to suggest remedies (and, therefore, *ad hoc* solutions cannot always be avoided), they would still prefer some empirical validation for what has been tried and found workable.

Interestingly there exist differences of opinion on the desirability of supporting big research projects. People seem to assume that for bigger problems, small research would not do. They think that for a national problem either a large project be supported or alternately an *ad hoc* arrangement would equally suit. Small projects of the action research type cannot make any dent in the case of national problems. It would appear that this belief is firmly rooted even in the case of those where small researches with shoe-string budget have shown promise and results.

On the whole this Sartre-type either-or-question continues to plague thinkers and administrators alike defying solution. The relative merits of big *vs.* small, broad *vs.* specific research has yet to be decided.

Organizations

In most cases the ministries of education seem to have patronised educational research directly. They either have a wing or a section on educational research attached to them or would like to have a research institute financed and controlled by them. The underlying philosophy is quite clear. The governments in this region have realized that research can be helpful to them in several ways and, therefore, should be kept as part of their own set-up. The expectations could constitute: (*a*) a quick made-to-order research, (*b*) diagnosing problem areas for reform purposes, (*c*) easy budgeting and funding research and (*d*) doctoring research results, if necessary.

Other than governmental agencies or bodies financed by public money, there are private individual efforts also besides the traditional channels of research which the universities offered through their regular postgraduate or doctoral programmes. In most cases these private bodies are either registered or grouped under a federation which one can surmise is an arrangement that is easy to handle or regulate.

Findings

Research programmes in the case of ministries are reflected in budgetary allocations of the government whether plan or non-plan, the expenditure for these researches are funded through public money, which means the limitations exist only in the nature of meaningfulness of these researches. Both supervision and control are, therefore, in the hands of the government as such the linkages between the research implications and reform are direct.

In the case of universities researches are undertaken because of several motivations, viz. academic reasons of pesonal advancement or as part of the job requirement. Irrespective of the motivations universities remain the major agencies of all types of research. They also have the advantage of having both the expertise and freedom of inquiry. Added to that is the benefit of having young scholars who are still inquisitive and willing to learn. The university academics are, therefore, always on the lookout for the funding agencies.

Individual scholars are the other agents of educational research other than those who after retirement seek some source of engagement, several private citizens also wish to take up research. The number of such persons needing money is limited and neither it is very easy for them to obtain it. Except for an occasional researcher, reseaches undertaken by scholars in this category seldom attained qualitative standards.

Typology

Large-scale researches tend to be both of cooperative and survey types. In this region with the exception of Philippines and India small researches do not appear to be popular. In several countries there is some degree of awe and distrust toward research. This distrust was reciprocated by the research Interestingly research did not lead to reform action and for compelling reasons reforms continued to be introduced even when research findings did not support them. Several countries were still in the process of starting research which meant that they had no system of either getting an informed action started or having it evaluated towards the end of it. Evaluation was now getting built into the reform action. This was a new feature. The West continued to influence research planning because of the academic backgrounds of the research scholars working in these countries. This was more noticeable when achievement or aptitude testing was undertaken in these countries. They were still using adaptations of the Western tests

Constraints

Except perhaps in the case of India, Japan and Australia all other countries suffered from lack of funds, paucity of expertise and faced organizational difficulties. Countries like Pakistan, Nepal and several others had no organization to match NIER, Japan or NCERT, India. They had no programme to train up young research workers and despite the fact that problems in these regions were of a different nature, their reliance for tools, techniques and methodology on the West, more specially on the USA was patent. There was urgent need to take up research but facilities did not exist. Several countries lacked the infrastructure for educational research. Most of the reforms in these regions were intuitively implemented. Research in fact followed action. Also, educational research was either sponsored by the Ministry of Education or was located in it. Except for Australia the association of the ministries of education with educational research was quite obvious.

The Future

It is being commonly realized that research has an important role in guiding reform action. Considering that people are gradually recognizing the significance of research of governments in this region would be setting up organizations like NCERT, India or NIER, Japan with the Regional Office of Unesco, Bangkok taking lead, the chances of greater institutional collaboration, international studies, etc. appear bright. □□

Ph.D. Theses Abstracts

Experimental Verification of Various Methods of Examination in History at the Lower and Higher Stages

BHARAT BHUSHAN SHARMA

BOTH RESEARCHES and commissions' reports have repeatedly highlighted the defects in the present system of examinations. These defects are more acute in social sciences as compared to physical sciences. An examination could have many functions but its central concern is with the precise and valid measurement of achievement in a given syllabus as a part of a discipline. It has been demonstrated that subjects which elicit precise responses are assessed more objectively than those which seek to impart mastery of complex skills and excellence not easily amenable to exact measurement. History has a distinct midway status between the exact sciences and literature, is wholly qualitative in its response material. Philosophies have expatiated on the unique status of history as a branch of human knowledge. Inevitably there is a degree of subjectivity in the assessment of history achievement and the methods thereof need improvement. The present investigation attempts to examine the relative soundness of various proposals of examination reform under experimental conditions both at the lower and higher levels of education because it is assumed that the nature of instruction in history changes with maturity of learners.

Aims of the Study

Primary Aims

1. To compare and contrast the reliability and validity of different types [of examination, i.e. essay type, short answer, open-book, objective type test and viva-voce in history at two levels.

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*Thesis submitted to Jammu University (1977)

**The publication of Ph. D. theses abstracts is financed by the Indian Council of Social Science Research, New Delhi

2. To examine the reliability of examiners in different types of examination.
3. To indicate the relative suitability of various forms of examination for the measurement of history achievement at two levels.
4. To check the effect of content coverage on the evaluation of examiners.
5. To appraise the significant differences between internal and external examiners.
6. To see the reliability of grades and marks at both the stages.
7. To see the inter-relationship between various types of examination in history at both levels.
8. To see the simple effects and interactions of various independent factors.
9. To highlight the deviations from normality in various types of examination and examiners.
10. To assess the overall power of discrimination of various types of examination.
11. To see the effect of relative length of content on the performance of pupils.
12. To see the relative merit of various aspects of achievement in history learning and their determining factors.

Secondary Aim

The secondary aim of the study was to familiarize the teachers in general and examiners in particular with the recent trends and proposals of examination reforms. Also to make the educationists and administrators conscious of the nature of examinations and proposed reforms especially in history. Also the research study had indirect objective of familiarizing the teachers and examiners with some of the reforms suggested by the University Grants Commission.

Limitations

1. The sample is limited to Jammu city at both the stages.
2. The N-40 at lower stage and N-25 at higher stage.
3. The study is limited to the evaluation of 10 examiners at each stage.
4. The investigation is limited to five types of examination : essay type, short answer, open-book, objective type test and viva-voce.

5. The research is based on the tests prepared by the investigator himself.
6. The factor-analysis is restricted to factory extraction and no factor rotation has been made.
7. No attempt has been made to calculate validity of the tests used in the study and they have been assumed to possess, the content validity.
8. The various types of examination tests have been prepared on limited content.
9. The research is based on only history examinations.

Sampling Design

Experiments were devised and conducted at lower and higher levels, i.e. matriculation and M.A. in all types of examination in history. The following sampling design was used :

	Stages	*Examinees*	*Examiners*	*Course*
1.	Lower Class (IX)	40	10	Specified portion
2.	Higher Class (M.A.)	25	10	—do—

Cluster sampling design was used to collect the data from students and random sampling was used for examiners.

Tools

For collecting the data the investigator employed a number of measuring devices for the assessment of history achievement. All were put up and developed personally by the researcher for the present research for both the stages. The assessment procedures employed are given below :

1. Essay type format
2. Short-answer type format
3. Open-book examination with essay type format
4. Viva-voce
5. Objective type test
6. Questionnaire for measurement of preference for objectives, methods, types of examination and aspects of history
7. Experiment for observing the effect of style, length and handwriting.

Analysis of Data

The data were put to the following analysis :

1. Distributions for central tendencies
2. Dispersions
3. Normality
4. Intercorrelations
5. General common and common factors derived from matrices of r's
6. Factor analysis for objectives of history at both levels
7. Coefficient of reliability by KR formula (20)
8. Three-way analysis of variances (3 × 3 × 3), a factorial design at both levels for the experiment.

Findings

The measures used in the course of this research are accepted as valid and sufficiently reliable indicators of the variables under study. The observation made under the present investigation lead to the following statistical conclusions.

1 The marks awarded by external and internal examiners in essay type, short-answer, open-book and viva-voce examinations show that internal examiner discriminates better among examinees in all types of examination because he knows students over a longer period of time. The external examiners produced in their marks narrower spread which indicates that the error of central tendency operated in their evaluation.

2. The results of the investigation go to show that there are wide differences in the marking standards of the examiners at both levels in essay type, short-answer and open-book examinations. The examiners give high marks due to personal factor or objective superiority of performance and there is a charge of subjectivity against the examiners at both stages.

3. The factorial analysis proves that the short answer would yield more reliable results in the sense of greater agreement among examiners at both stages. The essay type can work well at the high school stage and open-book fared the worst at both stages.

4. The recent trend in the examination reforms is the substitution of grades for marks. The findings of the study show that the grades reduce error of subjectivity in the examiners and can be introduced at the post-graduate stage for evaluation But the importance of grades and marks is considered almost equal at the high school stage The high factor loadings show that grades can possibly be used as a scale for assessment.

5 The findings of the investigation further show that the history learning is based on some objectives. Some methods and dimensions (factors) applied for efficient teaching and techniques are used for evaluating the answer-scripts of the examinees at both stages The analysis show the preferential order of objectives, methods, types of examination and dimensions (factors) which are given in Chapter IV (Part 4).

6. The factorial study of 11 objectives show that history includes all the objectives in a lesser or higher degree. At the school stage the second factor was polarized between intellectual versus emotional approach to history and it was found that cultural, Marxism taste, progress, knowledge of the past and cause and effect relationship were on the intellectual end and towards the emotional end by patriotism, hero-worship, and Divine purpose. At the postgraduate stage the second factor was polarized between relaxed liberalism versus radicalism The polarity includes at the liberal end internationalism, patriotism, knowledge of the past, cause and effect relationship and at the other end Marxism, maximum pass, progress of mankind and hero-worship Hence history is taught with different objectives at both stages.

7. The findings of analysis of variance done by 3×3×3 factorial design reveal that the three variables, i.e. style, length and handwriting effect the marking style of the examiners at the lower stage and at the postgraduate stage style and handwriting both effect the marking of the examiners. These two variables were found to be significant when taken independently The length did not seem to effect the marking of the examiners as it was found to be insignificant. It is, therefore, observed that examiners keep some other variables which effect their marking standard.

Educational Implications

The results obtained in the present investigation have the following educational implications.

1. Essay type examination cannot be a good measure of achievement of the students at the postgraduate stage. It works well at the lower stage, because the more comprehensive skills are required for answers and the rote memory is generally found to be active in the young children. We cannot do away with this type of examination. Therefore, it should be retained with improved objectivity at both stages.

2. The findings of the present investigation show that short-answer type examination can be a confident measure of evaluation in the achievement of history at both stages. Therefore, short-answer type as an evaluation technique be incorporated in the present system of examination.

3. Open-book examination has shown insignificant results at both stages which lead us to recommend that this type of examination cannot be introduced for evaluation Hence, the propounders of open-book views should take up longitudinal studies before bringing this type of evaluation technique into practice.

4. Objective type test should be introduced at both stages in order to avoid optioning effect, so that the whole portion of the content coverage be equally mastered by the examinees.

5. Viva-voce examination proved to be a good measure of achievement in history. Hence, it should also be incorporated in the examination system.

6. Grading instead of marking should be introduced in our system of examination at the postgraduate stage as the degree of correspondence among examiners, inter-comparability in grades and insignificant differences from the common criterion were observed among grades. The five-point or seven-point scale as recommended by the University Grants Commission be introduced to make the assessment procedure objective

7. The findings of the content analysis show that the sample of content in question papers also introduces its own component of error. The offering of choices will give the examinee an advantage to attempt the questions which he knows best. He will learn only that much of content which would help him to pass the examination. Therefore, the optioning in the format of question papers should be avoided to achieve the objective of mastery of the subject in the examinees.

8. The curriculum of teaching history at both stages should be based on the objectives like patriotism, internationalism and cosmopolitan outlook, acculturation and humanization, accurate knowledge of the past, progress of mankind and the chain of cause and effect relationship. The results have clearly revealed that the objectives—history as an economic progress according to Marxian formula, the fulfilment of a Divine purpose and history as a series of biographies of great men—should be given less importance or rather be ignored while teaching history.

9. The teaching of history at both stages should be based on the methods—audio-visual aids, question-answer and first-hand experience. The findings further show that lecture method works well at the postgraduate stage.

10. As regards the types of examination, it is suggested that the evaluation should be done through objective-type test with short-answer type examination and the combination of quiz type tests spread over the entire session plus annual examination at both stages. Essay type examination should be checked at the postgraduate stage but can be a measure at the lower stage according to the results of preferential analysis.

11. The trend of examiners for awarding marks to factual knowledge is very much conducive to convergent thinking. The teachers should keep in view all the component factors of history at the time of imparting historical knowledge.

12. The findings of analysis done by 3×3×3 factorial design reveal that the three variables—style, length and handwriting—effect the marking style of the examiners at lower stage and at the postgraduate stage The length of the answers was found to be insignificant when taken independently. The assessment of the examiners found to be effected by the style and handwriting when these two variables taken independently. The combined effect of three variables was found insignificant These interesting results show that examiners are not objective in their marking standard. The attempt should be made to standardize the evaluation procedure at postgraduate stage.

Suggestions for Further Research

Further research can be carried out on the lines suggested below :

1. The present problem revolved around examinations in history. The experimental verification of various methods of examination in physical and social sciences can be attempted.
2. The predictive extent of actual performance of pupils by different examinations and their magnitude in relation to best prediction can be taken as research problem.
3. A cross-sectional and a longitudinal study should be taken up whereby the temperamental effects of the examiners could be ascertained in relation to actual performance of the students.
4. An experimental verification of the efficacy of various types of examinations can be made. Keeping in view the sets of examiners, i.e. the discrepancy in their general judgement.
5. A study of different types of examinations suitable at different age levels and grades in terms of their discrimination can be searched forth.
6. An attempt should be made to develop prediction equation on the basis of norm referenced evaluation and criterion referenced evalution to see the discrepancy, if any, in the two.

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Effect of Different Techniques of Feedback upon the Attainment of Teaching Skills Related to Stimulus Variation among Teachers

KRISHAN KUMAR SHARMA

IN SPITE OF MANY EFFORTS, teacher education has not improved much in India and abroad. The commonsense approaches to student teaching—the 'born teacher', 'practising act', and 'model the master teacher' approach—could not produce tangible results upon prospective teachers The global criterion approach regarding teacher effectiveness in student teaching seems to have misled teacher educators and researchers. Recently, the analytical approach in student teaching was responsible for evolving new innovations in teacher education like classroom interaction analysis, competency-based teacher education or performance-based teacher education, sensitivity training, programmed instruction, computer-assisted teaching, microteaching and simulations. In view of the analytical thought regarding teaching, scientific approaches towards student teaching have come into being. Scientific approaches to student teaching are : the 'clinical' approach, the 'master the teaching model' approach and the 'technical skills' approach Recently 'technical skills' approach has been adopted under microteaching paradigm in simulation, as an innovative technique of teacher training.

With this background regarding the status of teacher education in general and student teaching in particular, an investigation has been made to study microteaching as an innovative technique of teacher training in Indian conditions.

The Problem

The present study is an experimental one pertaining to the area of teacher behaviour in the context of student teaching in teacher education. This study was conducted under two phases—pilot and final.

In the pilot study, treatment variables were supervisor, peer and self as sources of feedback in microteaching under simulated conditions. The dependent variables were two teaching skills, namely, reinforcement, and silence and non-verbal cues. The controlling variables were the age, sex, previous teaching experience and methods of teaching.

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*Thesis submitted to the M.S. University, Baroda (1976)

In the final study, the treatment variables were discussion, oral and written techniques of peer feedback in microteaching under simulated conditions. The dependent variables were three teaching skills related to stimulus variation, namely, body movement, gestures and shifting sensory channels. The controlling variables were the age, sex, qualification, percentage of marks and methods of teaching.

Objectives

The study was undertaken to fulfil the following three objectives :

1. To study the feasibility of microteaching as an innovative technique in Indian conditions without the use of hardware.
2. To study the differential effect of three techniques of providing feedback on the attainment of teaching skills related to stimulus variation. Three techniques of peer feedback selected for the study were discussion, oral and written. Two cycles (four teach- and reteach) per skill were delivered for practice Peer, supervisor and self ratings were taken on two skills and in the case of the third skill, only peer rating was taken. Skills related to stimulus variation were body movement, gestures and shifting sensory channels.
3. To study the transfer of training from microteaching under simulated conditions to real classroom teaching.

Hypotheses

1. There is no differential effect of three different techniques of peer feedback-discussion, oral and written, upon the attainment of the skill of body movement.
2. There is no practice effect of lessons upon the attainment of the skill of body movement.
3. Peer and self do not differ in their rating of the performance for the skill of body movement.
4. There is no differential effect of three different techniques of peer feedback-discussion, oral and written, upon the attainment of the skill of gestures.

5. There is no practice effect of lessons upon the attainment of the skill of gestures.
6. Peer and self do not differ in their rating of the performance for the skill of gestures.
7. There is no differential effect of three different techniques of peer feedback-discussion, oral and written, upon the attainment of the skill of shifting sensory channels—total record of events.
8. There is no practice effect of lessons upon the attainment of the skill of shifting sensory channels total record of events.
9. There is no differential effect of three different techniques of peer feedback—discussion, oral and written, upon the attainment of the skill of shifting sensory channels—total shifts in events.
10. There is no practice effect of lessons upon the attainment of the skill of shifting sensory channels—total shifts in events.
11. There is no difference in the attitude of three experimental groups (discussion : feedback treatment—E_1, Oral : feedback treatment—E_2, and written : feedback treatment—E_3) towards microteaching programme.
12. There is no difference in self-evaluation of three experimental groups towards microteaching programme.
13. There is no differential effect of two different techniques of training—microteaching, simulation and conventional teaching practice with regard to general teaching competence, transferred to classroom teaching.

Design

In the pilot study, single group design was followed In the final study, pre-test and post-test parallel group design was followed.

Sample

The pilot study was conducted on a sample of 18 female B.Ed. students enrolled at the Faculty of Education and Psychology, M.S. University of Baroda, for the session 1973-74. The final study was conducted on 32 female B.Ed students of the D.A.V. College of Education, Abohar (Punjab) for the session 1974-75. Out of four groups, three groups were given experimental treatment and the fourth group was the control group. Six student-teachers who were having M.A and M.Sc. degree were selected as peer supervisors.

Treatment

The treatment was administered in the following manner :

1. Pre-test (school stage).
2. Laboratory stage (training).

    i. Characteristics of a teacher
    ii. Roles of a teacher
    iii. Skills of teaching
    iv. Skills related to stimulus variation
    v. Orientation to microteaching, simulation, and role-playing
    vi. Planning of microlessons
    vii. Training in three skills.

3. Administering of the attitude scale of teacher-trainee towards microteaching, the self-evaluation proforma for microteaching programme (simulated conditions) and the free-response evaluation proforma for microteaching programme (simulated conditions).
4. Post-test (school stage).

Tools Used

In the pilot study the following tools were used :

1. Skill evaluation proformas for the skill of reinforcement and silence and non-verbal cues for the supervisors.
2. Skill evaluation proformas for the skill of reinforcement and silence and non-verbal cues for the peers and the microteachers.
3. The attitude scale of teacher-trainee towards microteaching.
4. The FIACS matrices.
5. Open-ended essay programme.

In the final study, the following tools were used :

1. Personal information sheet
2. General teaching competence observation schedule
3. Skill evaluation proforma for the skill of body movement
4. Skill evalution proforma for the skill of gestures
5. Skill evaluation proforma for the skill of shifting sensory channels
6. Attitude scale of teacher-trainee towards microteaching

7. Self-evaluation proforma for microteaching programme (simulated conditions)
8 Free-response evaluation proforma for microteaching programme (simulated conditions).

Findings

Analysis of Variance (3×4×2), covariance and t-test were employed to the data and the following findings have been reported from the results of the study.

1. Out of the three techniques of feedback, discussion is the most effective technique of providing feedback by peer supervisors for the attainment of the skill of body movement.

2. Out of the three techniques of feedback, written feedback is the most effective technique of providing feedback by peer supervisors for the acquisition of the skill of shifting sensory channels.

3. With regard to effectiveness, there is hierarchy among the three techniques of feedback. The descending order is discussion, written and oral.

4 For the skill of shifting sensory channels—total shifts in events—oral feedback is better than discussion feedback. Discussion feedback is the least effective in this case.

5. There is no differential effect of three techniques of feedback upon the attainment of the skill of gestures,

6. There is practice effect of microteaching lessons in the gradual improvement in performance of the skill of body movement practised under microteaching conditions.

7. There is practice effect of lessons of the gradual improvement in performance of the skill of gestures practised in microteaching simulation.

8 There is practice effect of lessons on the gradual improvement in performance of the skill of shifting sensory channels related to total shifts in events practised in microteaching simulation.

9. There is no practice effect of lessons on the gradual improvement in performance of the skill of shifting sensory channels related to total record in events practised in microteaching simulation.

10. The peer rating of his colleague's performance on the skill of body movemement and gestures always differ from the self (microteacher); the peer rating always remains at a lower level than of the self.

11. The student teachers who had undergone microteaching training under simulated condition showed favourable attitudes towards microteaching programme.

12. The student-teachers who had undergone microteaching training under simulated condition showed similar opinion towards the microteaching programme.

13. Microteaching in simulation is more effective a technique for transfer of general teaching competence to classrom teaching than the conventional practice teaching; microteaching in simulation produces same effect irrespective of the difference due to different techniques of providing feedback.

On the basis of content analysis of the free responses of three experimental groups on the free-response evaluation proforma, the following conclusions can be drawn.

1. Microteaching is an effective and economical component skill approach of teacher training.
2. Stimulus variation is an important skill for the teacher to make his teaching more lively and interesting.
3. Non-verbal behaviour on the part of the teacher helps him to make certain ideas and concepts clear to the pupils, to motivate them, to get their attention and to bring variety in the lesson But non-verbal behaviour is more effective when its meaning is interpreted along with verbal behaviour and in the context of culture.
4. Skills related to stimulus variation play specific roles · body movement is helpful for class control, getting pupils' attention, encouraging pupils and for expressing ideas but too much movement distracts the class, gesturization is helpful for making the lesson interesting, making certain concepts clear but relevancy in gesturization is essential; and shifting sensory channels creates good classroom climate, involves maximum number of students, helps to communicate ideas in a variety of ways but the duration of shifts and variety among the channels may be properly maintained.
5. Feedback system in microteaching is very effective because it is pinpointed, immediate and brings strong and weak points to trainee's notice. Discussion feedback seems to be the best out of three techniques but peer supervisors need to have understanding of various issues of a skill.
6. Peer supervisory feedback is very effective if peers are properly oriented. They understand the practical difficulties of their colleagues in a better way than a college supervisor; college supervisors are needed at certain crucial points where expertise is needed.
7. Playing the role of a pupil is pedagogically sound, provided it is played with all seriousness. Playing the role of microteacher in simulation

develops courage, confidence and is enjoyable. Playing the role of a peer supervisor helps to become more critical minded and responsible peer.

8. Model lesson by the college supervisor is essential at the initial stage for clarification and for standard of excellence of a skill. Model lesson by peer supervisor provides an additional information because of variety in models presented before the trainees: discussion after model lessons provides extra information to teacher trainees.

9. Microteaching in simulation may or may not be better than the real. Yet it is a good setting for skill learning. Microteaching with real pupils should be followed by simulation.

10. Regarding practice periods, no one conclusion could be drawn due to mixed views.

11. Opinion of the student-teachers towards microteaching in experimental groups in favourable except a few cases who felt it boring and tiring.

12. Some suggestions were also given to improve upon microteaching programme. These are : real pupils should be involved; more college supervisors should join the programme, time of practice should be extended ; peer supervisors should be properly trained; some lessons should be arranged in micro-situation; and all the trainees should undergo microteaching programme.

Implications

In the light of the findings of the study, student-teaching programme should have three broad phases—the skill-based theory stage, the laboratory stage and the school stage. At the laboratory stage, microteaching in simulation may be adopted as a training technique for practising of the skills. Peers should be involved for providing feedback in microteaching Diagnostic and remedial measures should be adopted in colleges of education with microteaching as an integrated programme of student teaching.

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A Study of Attitudes towards Science and Scientists among Certain Groups of Students and Teachers in India

J. K. SOOD

MUCH NATIONAL ATTENTION has recently been focused on science and scientists. There are approximately 80,000 scientists employed by different scientific organizations in India alone. It is by all accounts a sufficiently large number to spark off a scientific revolution in the country provided economic and social conditions help in the process. India has the third biggest research community in the world, but rates fifteenth in productivity. The output of an individual scientist in India is only a third of world's average and the masses, by and large, are much wrapped up in superstition, illiteracy and ill health. A scarcity economy further complicates matters. All these factors, taken together, militate against the development of attitudes, which are basic to the creative and objective development of scientific knowledge. The enlightened citizen, who has the responsibility of interpreting the social consequences of new discoveries in the field of science, must be well-informed and knowledgeable about science. It is only thus that public opinion could bring about awareness of the important role of science and create the proper climate and the cultural conditions for encouraging and sustaining the growth and development of science. Although the scientist believes that science must serve society, he also insists that it develops most vigorously in an unfettered and free environment. In India litttle effort has been made to take note of what students and teachers think of science and scientists. The present investigation is an attempt to measure the attitudes of students and teachers of science towards science and scientists and to analyse their understanding of the nature of science. This study measures the attitudes as they now exist among students and teachers and no attempt has been made to discover the origins of the attitudes.

Purposes

The purposes of this study were :

1. To construct an attitude scale so as to measure attitude towards science and scientists.

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* Thesis submitted to the University of Rajasthan, Jaipur (1974)

2. To study attitudes towards science and scientists among certain groups of students and teachers.
3. To determine the differences concerning attitudes towards science and scientists between students and teachers.
4 To find out the differences concerning attitudes towards science and scientists between male and female students and teachers
5. To determine the relationship between students' and teachers' understanding of the nature of science.
6. To find out how far the favourable attitudes of teachers help in the development of favourable attitudes among students towards science and scientists.
7. To find out whether favourable attitudes towards science and scientists help in understanding the nature of science
8. To determine how far attitude towards science and scientists were related to the socio-economic background of the students and teachers.

Hypotheses

1. There was no relationship between students' and teachers' attitudes towards science and scientists
2. Teachers' attitudes concerning science and scientists did not affect pupils' attitudes.
3. Differences of sex did not, significantly, affect attitudes towards science and scientists.
4. There was no relationship between attitudes towards science and scientists on the one hand and understanding of the nature of science on the other.

Sample

The total sample comprised 1,000 students and teachers. The distribution of the total sample was as follows :

Group I

1. Students of Rajasthan and Delhi studying in the final year of the higher secondary class (N=300)
2. Science teachers of Rajasthan and Delhi (N=200)
3 Non-selected science talent search students from Rajasthan and Delhi (N=200)

4. National science talent search awardees from all over the country (N = 100)
5 Science teachers from seven different states : Rajasthan, Uttar Pradesh, Punjab, Haryana, Jammu and Kashmir, Delhi and Himachal Pradesh (N = 200).

Students were selected from Seven schools of Rajasthan and Seven schools of Delhi. These were English medium schools and students were from a high socio-economic starta

Instruments Used

The following three tests were administrered .

1. An Attitude Scale : Attitudes towards science and scientists.
2. Test on Understanding Science Form W :
   The Test on Understanding Science (TOUS) was developed at the Harvard University Graduate School of Education. This test was developed by Cooley and Klopfer. It consists of 60 items. The test on understanding science is being used to determine the understanding of the nature of science and scientists among students and teachers. This test was adapted after certain changes. To determine the reliability in Indian conditions, this test was administered on 400 students and science teachers. The reliability was determined with the help of split-half method The reliability was found to be 0.859.
3. Socio-economic Status Scale Questionnaire (SESSQ—Urban) :
   The socio-economic status scale questionnaire was developed by Jalota, Pandey, Kapoor and Singh There are five components of this scale seeking information about the parental occupation, education, income, cultural level of the family and aspirations The reliability and validity of this test has been determined by the authors.

In addition, annual examination marks of the students were taken into consideration.

The Development of an Attitude Scale

To make a survey of the attitudes of the selected groups of students and teachers an attitude scale was developed by the investigator. The scale comprised 100 statements. Likert-type scale was developed on the following four major themes :

1. The nature of science
2. The scientist
3. Scientific work
4. Science and society

In the selection of the statements, many precautions were considered and, finally, the statements were selected on the basis of criterion of internal consistency. All the statements which fell below .03 level of significance were dropped.

Reliabilities

The reliability was determined by the split-half method. It was found to be 0.765 on a sample of 400 students and teachers, selected randomly.

Validity Evidence

Content and face validity was established by reactions of the various groups of experts to this scale. Correlation between the attitudes scale and the test of understanding science was found to be 0.98 which is significant at beyond .01 level (Lindquist 1968). This established the concurrent validity of the attitude scale.

Statistical Analysis

Analysis of the results of this investigation was made through the utilization of t-test. To determine the relationship of the attitude scale and the test on understanding science, the coefficient of correlation was computed between the attitude scale and the test on understanding science. In order to find out the coefficient of forecasting efficiency (E), and the coefficient of determination separate analysis was done.

Results and Conclusions

The investigations yielded the following conclusions.

1. The relationship between attitudes and understanding of the nature of science was determined. This study yields a product-moment correlational coefficient of 0.98 which is highly significant. This means that, under the conditions of this study, attitudes towards science and scientists and

understanding of the nature of science are highly related, that is, persons high on attitudes towards science and scientists are, by and large, high on the test on understanding science also

2. This study revealed that the mean of the total sample (N=1000) was 369.40 and SD 26.70. The mean, therefore, indicates that the total sample reflects positive attitudes towards science and scientists. The sample mean of 369.40 is considerably higher than the theoretical mean of 300 of the total scale; hence the above conclusions. It can be concluded that the science teacher in our classroom is fairly effective.

3. The mean score of science teachers (N=200) is higher than the mean score of students (N=300) There is a significant difference between the attitudes of students and teachers. It was evident that the science teachers' sample studied did hold the more favourable and constructive attitude towards science and scientists than that of the science students.

4. The mean score of science teachers (N=200) on attitude scale is higher than the mean score of the non-selected National Science Talent Search students (N=200). It was revealed that there is a significant difference in attitudes towards science and scientists between non-selected NSTS students and science teachers. It is also evident that non-selected NSTS students reflected better attitudes than the other groups of students.

5 The mean score of the NSTS awardees (N=100) is higher than the mean score of science teachers (N=200). This difference between the means was tested for significance by using the *t*-test, the *t*-ratio was 0.6 which is less than even unity. Therefore, there is no significant difference between the NSTS awardees and science teachers.

6. This study revealed that there is significant difference in attitudes towards science and scientists between NSTS awardees (N=100) and non-selected NSTS students (N=200).

7 The socio-economic status scale was used to determine statiscally significant differences. It was recorded that the attitudes are better disposed in favour of those who are from better socio-economic status

8. This study revealed that there is no significant difference in attitudes towards science and scientists due to sex differences

9. It was revealed that the difference in understanding of the nature of science between science teachers (N=200) and students (N=300) is not significant. The difference is only due to chance factor In other words, the teachers and the taught are at par in their understanding of the nature of science.

10. The mean ratio of the non-selected NSTS students (N=200) is higher than that of the science teachers from different schools of seven states (N=200). But the *t*-ratio was only 1 58, which is less than 1 96 Therefore,

the difference is only due to chance factor.

11 The difference in means between NSTS awardees (N=100) and non-selected NSTS students (N=200) is highly significant. It may be concluded that there is a significant difference in understanding of the nature of science between NSTS awardees and non-selected NSTS students.

12. The test on understanding science revealed that understanding of the nature of science of the total sample (N=1000) was not so unfavourable as indicated by mean score of 30 of the total of TOUS.

13. There are no significant differences either in understanding of the nature of science between non-selected NSTS students (N=200) and science teachers from seven different states (N=200).

14. There was significant difference, however, between the NSTS awardees (N=100) and non-selected NSTS students (N=200) as measured by the TOUS. The t-ratio of 10.20 indicates that the difference was highly significant.

15. There was a significant difference on TOUS between the NSTS (N=100) and science teachers from different schools of seven states (N=200). The findings have revealed that science teachers did not gain understanding of the nature of science with longer teaching experience or with age.

16. This study has uncovered many deficiencies concerning the understanding of the nature of science and its social implications. This has its educational implications too. The curriculum in science, the classroom practices, and the education of the science teachers need replanning to help in correcting these deficiencies.

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A Critical Study of the Development of Teacher Education in Rajasthan

G. N BHARDWAJ

THE PURPOSE of this study was to gather evidence regarding some of the significant trends in teacher education in Rajasthan in terms of the following important issues with the teacher education institutions :

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*Thesis submitted to the University of Rajasthan (1977) (*i*) organization and administration ; (*ii*) enrolment and admission; (*iii*) the professional subject-matter; (*iv*) student-teachers' professional academic performance; (*v*) methods of instruction and evaluation, (*vi*) faculties, (*vii*) libraries and laboratories ; and (*viii*) in-service and extension activities. This study also made detailed case-studies of five selected teacher-training institutions to establish the position of teacher education in the state.

Sample

All teacher education institutions (20) in the state have been taken for study in this investigation. These 20 institutions include 17 under the University of Rajasthan, two under the University of Udaipur and one institution under the University of Jodhpur.

Sources of Data

A survey of all the institutions was made with the help of a questionnaire prepared for the purpose. Information about the various aspects were also obtained from other sources which include : records available in the respective institutions ; records available in the three universities in the state; syllabi and ordinances published by the three universities ; Report of the Second National Survey of Secondary Teacher Education conducted by the NCERT; reports of various sub-committees appointed by the Faculty of Education for consideration of admission procedures, report of the Shukla Committee appointed by the University of Rajasthan and interviews.

Procedure

The information about the 20 teacher education institutions received through the questionnaire, interview and other sources of data was analysed, classified and critically examined. Intensive case-studies of five teacher education institutions was also done to confirm the broad trends of the teacher education programme in this state. These five institutions were : Government Teachers' College Bikaner, Gandhi Vidya Mandir T.T. College Sardarshahr; RCE, Ajmer; S.S.G. Pareek T.T. College, Jaipur, and Hitkari Cooperative College of Education (Women), Kota.

Findings and Conclusions

1. Out of 20 institutions, two are run by the State Government, one is run by the NCERT, four are aided by the State Government and 13 are run

by private management committees. Two institutions are exclusively for female student-teachers while in other institutions student-teachers of both the sexes are admitted. The study shows that 70 per cent of the institutions are residential and 30 per cent are partly residential. The study reveals that most of the institutions do not provide hostel accommodation to the students-teachers The selection of the members of the staff is made by the managing bodies which include the representatives of the government and the university also. In some of the institutions prominent teacher-educators also represent as experts.

2. In all the three universities the minimum qualifications required for admission to one-year B. Ed. degree is a bachelor's or master's degree with two teaching subjects at the graduate level. For a four-year course in B. Sc., B. Ed., the minimum qualification for admission is higher secondary or pre-university course or intermediate (science) in the case of students from U.P. with atleast 45 per cent marks in aggregate. For M.Ed. course the minimum academic requirement is a graduate or postgraduate with B.Ed., B.T., or L.T. Candidates possessing B. Tech., Ed. or B.Sc., B Ed., degrees are also eligible for admission. The criteria of selection has been changing and had varied in different institutions from time to time. A common criteria for all the institutions affiliated to the University of Rajasthan has been proposed from the session 1974-75. At the B.Ed. level out of 20 institutions, five institutions admit 60 student-teachers, nine institutions admit 120, two institutions admit 180 and two institutions admit 240 student-teachers. One institution admits 250 student-teachers while the other admits 450 student-teachers in the various courses run by the institution (RCE, Ajmer). At the M.Ed. level in two institutions the sanctioned strength is ten while in other three the sanctioned strength is 15, 20 and 30 student-teachers

3. In all the institutions except the RCE, Ajmer, in theory, 0.74 per cent secured first divisions, 45.02 per cent second division and 51.95 per cent third division during 1948-73. In all 2.29 per cent student-teachers failed in theory. As there was no internal assessment during 1948-1960, there were more failures and less number of first classes. In practice teaching, 99.95 per cent passed which include 10.14, 75.59 and 14.22 per cent in first, second and third division, respectively. In the RCE, Ajmer from 1964 to 1973, 13.1 per cent secured first division, 78.2 per cent second division and 3.1 per cent passed in third division. In all, 5.6 per cent failed at the examination in the one-year course in science, agriculture and commerce. In the case of one-year languages 96.4 per cent passed in theory while cent per cent passed in practice teaching. In the four-year course 18.6 passed in first division, 67.5 in second division and 6.5 per cent passed

in third division During the last 20 years (1953-1973) 96.2 per cent out of 598 students passed while 3.8 per cent failed at the M.Ed examination. Out of this 27.1 per cent were placed in first division while 69.1 per cent secured second division The scheme of evaluation at the M.Ed. level was entirely external from 1953 to 1957. The number of first divisioners was comparatively less and the number of failure was high. Afterwards 25 per cent of the marks were allotted to the internal assessment, which increased the pass percentage.

4. The medium of instruction in the institutions is Hindi and English at B.Ed and M.Ed. levels and English at the Ph.D. level. The medium of examination is the same as the medium of instruction. The duration of period varies from 35 minutes to 45 minutes in different institutions

5. There has been a variation in the number of theory papers at the B.Ed. and M.Ed. levels during the last 25 years. At present, for the institutions under the Rajasthan University a common scheme has been proposed in which there are four compulsory papers and two optional papers. An additional optional paper is also offered by the students for specialization. There is a slight variation in the other two universities in the stage. At the M.Ed. level there had been a little variance Two papers are in the compulsory list and a student has to select any three other papers from the optionals. Almost the same papers are prescribed by both the universities running M.Ed. course.

6. In all the three universities of the state the practice teaching programme for the B.Ed. course is organized in the same manner with slight differences here and there. In the RCE this programme is named as Internship in Teaching.

7. Problem is selected for research at the M.Ed. level by the student himself (in three institutions), by the supervisor (in one institution) and in one case the problem is selected after mutual discussion between the student and supervisor. The greatest number of M Ed research studies (dissertation) are in the area of psychology The other areas include : Educational administration and finance; Achievement; Educational and vocational guidance; Teacher education; Text construction, etc. There are, however, other areas also where the number of studies is very small At the Ph.D. level, 15 scholars have been awarded the degree by the universities of Rajasthan and Udaipur. The various areas studied at this level are : Personality; Staff relations and teacher association; Intelligence; Interest and achievement, etc.

8. Almost in all the institutions at the M.Ed and B.Ed. levels, lecture method, assignments and discussions are used as methods of instructions. At the B.Ed. and M.Ed. levels in all the three universities 25 per cent marks

in each theory paper have been reserved for internal assessment There is a little variation in the case of Jodhpur University where this is 30 per cent. In all the three universities distinction, first class, second class and third class are awarded at 75, 60, 48 and 36 per cent marks respectively at M Ed. and B.Ed. levels except that third class is not awarded at the M.Ed. level. A minimum pass marks (30 per cent) is also essential in the case of each paper at the B.Ed. level Practice teaching is assessed internally as well as externally.

9. In most of the institutions the main source of income is the fees charged from the students. Four institutions get grant-in-aid from the State Government and three are run by State and Central Government. The rate of fee charged varies from institution to institution.

10. All the institutions have prepared to have trained librarians in their libraries. The number of books vary from 1,269 to 41,651 from institution to institution. The number of journals vary from 7 to 185 in the different institutions. The data has indicated that most of the institutions have psychology laboratories and some of them have science laboratories

11. The five extension centres have done some creditable work in the field of intructional material, seminar readings, experimental projects, etc.

Recommendations

1. The education and training of teachers may be divided into three consecutive stages :

i. The first—personal education—a course leading to a degree or a two-year course leading to a new award to be called Diploma in Higher Education. The institution will not be training teachers in isolation and there will be no complaints about 'trapped into teaching'.

ii. The second—a two years' professional preparation—which may or may not be offered in the same institution. The first year of this stage may be devoted to theoretical exploration of disciplines contributing to the study of education and practical work. The students, who have not studied the educational course at the first stage, may be asked to take an additional course. After successful completion of the first year of this stage the student may be recognized as a 'licenced teacher'. This licenced teacher may be assigned (with a deliberately reduced time table) his first teaching assignment under the school-based training. After successfully completing the second year of the stage the licenced teacher would become a 'registered teacher' and a professional degree may be awarded to him.

iii. The third the student may be open to a wide range of activities at intervals through out his working life, where he may continue his personal education and extend his professional competence. The teacher may be entitled for in-service education and training (on full pay) for one term in every seven years

2. A central training council may be established in order to integrate the training institutions, which may look towards the supply and training of teachers, the available resources with each area, exploring the needed extension of existing institutions, etc. The rapid expansion of secondary teacher training institutions in the University of Rajasthan should be restricted.

3. No student should be admitted to the B.Ed. course unless he/she has obtained at least 45 per cent of marks in the aggregate at the qualifying examination. Admission should be centralized in the university to avoid malpractices. Test and viva voce should be abolished. As the internal assessment plays a great part in the college of education, the faculties of universities should explore means for formulating a valid and uniform system of evaluation.

4. It has been advocated that the teacher should be well informed and the professional training of teachers must begin with the student's beliefs about people, which may be developed through four avenues : the study of behaviour; personal experience of faculty beliefs and values; the ways they are treated by the college staff; and through personal involvement with children and adults. The professional programme must provide opportunities for students to move at varying rates of speed. More responsibility for learning must be placed on the student himself by demanding from him an active part in his own education.

5. The university should prescribe uniform schedule of fees and the admission should be centralized in the university to avoid donations from students, etc. It should be ensured that the institution charges hostel fees only when proper accommodation has been provided to the student-teachers

6. The teacher training institutions should accept their responsibility for assisting in the in-service stage of teacher training. Extension services departments should also be established in all the institutions.

7. The content of the M. Ed. course should have at least one specialization and provide a fair acquaintance with the methodology of educational research, besides promoting a desirable intellectual discipline.

8. No candidate should be admitted to a research course in education

unless he has shown sufficient evidence of his capacity for independent thinking and critical examination of theories and facts. No person should be appointed as a supervisor unless he himeslf possesses a doctoral degree or has published recognized research work to his credit or is an eminent scholar in his field. Fundamental research in education should be encouraged but candidates should be inspired to take up practical problems facing the country that need urgent solution. It would be desirable to work out some criteria for the general guidance of examiners to achieve a high degree of objectivity in the evaluation of performance of candidates.

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An Experimental Study in Programmed Learning for Teaching Research Methodology Course at M.Ed. Level

D. N SANSANWAL

APPLICATION OF PRINCIPLES of physical sciences has provided various equipments such as radio, television, films, slides, etc. These can be used in instructional process to make it more effective. Similarly, behavioural sciences have certain principles about human behaviour, application of which has provided various instructional techniques such as programmed learning, lecture, discussion, seminar, team teaching and the like. In instructional process both equipments based on principles of physical sciences and instructional techniques evolved from principles of behavioural sciences are used When instructional process is looked into it becomes evident that it involves the use of several equipments and techniques. For understanding and controlling instructional process, it is not enough to study its use in isolation; it has to be considered in a total situation where each appears as a component of a total system aimed at realization of instructional objectives. The use of equipments and techniques and the combination in which they would be used in instructional process would depend upon the objectives of instruction at a particular level of education. Objectives of instruction would be different at different stages of education. For the realization of all the objectives for a group, therefore, it would be necessary to use more than one technique. The combination in which these techniques may be used can be evolved through experimentation. The present study is an attempt to evolve such an instructional strategy using several instructional techniques in proper combination for teaching a course on research methodology to postgraduate students of education studying for M.Ed. degree.

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*Thesis submitted to M.S. University of Baroda (1977)

As stated earlier, different techniques may be needed for the realization of different objectives of instruction at postgraduate level Programmed learning is one such technique. In programmed learning the instructional material is pre-arranged in a logical sequence so that students can learn at their own without the help of a teacher. This may be used for giving them certain basic information. Another technique that seems to be appropriate for some of the objectives stated above is that of library work. Library work is purely a student's activity and it develops in student's independent study habits and reading interests, ability to select and organize relevant material, and to think critically and evaluate.

In the above techniques students interact with material only. Discussion is a technique where they find opportunity for human interaction which seems to have great potential for realizing certain objectives envisaged for teaching at postgraduate level. Through these instructional sessions students can express their views, can seek clarifications or react to other's point of view. The pre-requisite for using this technique in instructional process is that the students should have the basic knowledge of the content. This pre-requisite knowledge can be given through programmed learning material and library work. After they have acquired basic knowledge through these two techniques, discussions may be held.

One more technique that seems to be appropriate for realizing some of the objectives stated above is seminar. It is to provide a forum for presentation of information about a topic. The purpose of this technique is not to provide basic information on the topic but to arouse thinking and create interest in the topic. Students would independently prepare and present papers on topics of their interest but related to the course under study. This would be followed by the guided discussion.

As can be seen from the above, programmed learning, library work, discussion and seminar may be effective techniques to realise the objectives of instruction set for the course on research methodology at M.Ed. level. How effective they turn out to be in actual practice and in what combination they should be used are to be determined experimentally in the light of empirical evidences obtained. In this study, therefore, a few of students' characteristics, viz. intelligence, academic motivation, previous academic achievement, English reading comprehension and their reaction towards this instructional strategy, which seem to be more pertinent in this situation, have been studied in relation to their achievement.

Objectives

1. To develop the instructional material for each of the components for teaching the course on research methodology as specified in the M.Ed. syllabus at the M S University of Baroda.
2. To study the effectiveness of the instructional strategy as a whole in terms of student's performance on criterion tests and a comprehensive test.
3. To study the effectiveness of individual components of instructional strategy in terms of student's relation to each component of it.
4. To study the relationship between achievement through the instructional strategy and the student's characteristics : (*a*) intelligence, (*b*) academic motivation, and (*c*) English language reading comprehension.
5. To compare the achievement of students of · (*a*) high, average and low intelligence by taking academic motivation and English language reading comprehension as covariates, (*b*) high, average and low academic motivation by taking intelligence and English language reading comprehension as covariates, (*c*) high, average and low English language reading comprehension by taking intelligence and academic motivation as covariates.
6. To study the student's reactions towards instructional strategy with respect to their level of (*a*) achievement, (*b*) intelligence, and (*c*) academic motivation.
7. To study the trend of change in student's reactions towards instructional strategy, and their academic motivation over the period of experimentation.

Hypotheses

1. There is no significant relationship between achievement of students through the instructional strategy and their intelligence
2. There is no significant relationship between achievement of students through the instructional strategy and their academic motivation.

3 Their is no significant relationship between achievement of students through the instructional strategy and their English language reading comprehension.
4. There is no significant difference in mean achievement of students belonging to high, average and low intelligence groups when their mean achievement scores are adjusted with respect to academic motivation and English language reading comprehension.
5. There is no significant difference in mean achievement of students belonging to high, average and low academic motivation groups when their mean achievement scores are adjusted with respect to intelligence and English language reading comprehension
6. There is no significant difference in mean achievement of students belonging to high, average and low English language reading comprehension groups when their mean achievement scores are adjusted with respect to intelligence and academic motivation
7. There is no significant change in academic motivation of students over the period of experimentation.

Sample

The experiment was carried out over a period of two academic sessions —1975-76 and 1976-77. All the 37 M Ed. students admitted during 1975-76 who received instructions on full-time basis in the M.S. University of Baroda were included in the sample utilized for the tryout of the material developed for each component of the instructional strategy. All these students hold B.Ed. degrees. All the 24 M.Ed. students admitted during 1976-77 who received instructions on full-time basis in the M.S. University of Baroda were included in the sample that was utilized for studying the effectiveness of each component of the instructional strategy and instructional strategy as a whole. Besides, the sample was also utilized for studying the relationships between student's characteristics and their achievement through instructional strategy. In addition to these M Ed. students, 43 M.Sc. students of Faculty of Home Science of the same university offering research methodology course along with M.Ed. students were also included in the sample. In all, therefore, the sample consisted of 67 students. All these M.Ed. students were B.Ed. degree holders while home science students did not have B.Ed. degree. They were home science graduates.

Procedural Details

1. Instructional material for each component, viz. programmed learn-

ing material (PLM), library work, discussion and seminar of the instructional strategy was prepared. For developing PLM on research methodology course, the content was analysed and terminal behaviours were stated.

2. The developed instructional material was tried out on a sample of M.Ed. students admitted during 1975-76 session. On the basis of the results of this study, necessary modifications in the materials were made. Also the sequential arrangement of each component was studied empirically. The instructional materials thus developed were used in the final experimentation.

3. The instructional material tried out was used during academic session 1976-77 for studying the effectiveness of each component. The effectiveness was studied in terms of student's reactions towards each component of the instructional strategy.

4 The effectiveness of the instructional strategy as a whole was established in terms of student's performance on criterion tests and a comprehensive test. During the experimentation, after the completion of each unit, criterion test was administered while the comprehensive test was given only after the completion of all the units.

5. During 1976-77 academic session, measures of students on intelligence and English language reading comprehension were obtained by administering Raven's standard progressive matrices and a comprehension test (Govinda 1975). Measures of students on academic motivation were obtained by administering junior index of motivation scale at two points of time during the experimentation.

6. The data were analysed by computing means, standard deviations, skewness, percentiles, percentages, correlation, partial correlation, analysis of covariance followed by *t*-test.

Findings

1. The instructional strategy was found to be effective to the extent that 70 per cent of students got above 70 per cent of marks on all criterian tests.

2. Individual components and instructional strategy as a whole was found to be effective in terms of student's reactions towards them. This was due to the fact that a large majority of students opined that individual instructional component and the sequence in which various instructional components were used helped them in learning.

3. (*a*) Achievement of students through the instructional strategy was found to be significantly related with intelligence. (*b*) Academic motivation of students was not significantly related with their achievement through

instructional strategy. (*c*) Achievement of students through instructional strategy was not significantly related to their English language reading comprehension.

4. (*a*) The mean achievement score of students belonging to high intelligence group is significantly higher than that of average and low intelligence group's students. Also, the mean achievement of students belonging to average intelligence group is significantly higher than that of low intelligence group. These were the results when the mean achievement scores were adjusted with respect to their academic motivation and English language reading comprehension (*b*) The mean achievement scores of students belonging to high, average and low academic motivation groups do not differ significantly when the achievement scores were adjusted with respect to intelligence and English language reading comprehension. (*c*) The mean achievement scores of students belonging to low English language reading comprehension group is significantly lower than the students from high as well as average English language reading comprehension groups.

5. (*a*) A large majority of students from high, average and low achievement groups had favourable reactions towards individual instructional components and thereby towards the instructional strategy as a whole. (*b*) A large majority of students belonging to high, average and low intelligence groups reacted favourably towards individual instructional components and instructional strategy as a whole (*c*) A large majority of students belonging to high, average and low academic motivation groups were of the opinion that each instructional component and instructional strategy as a whole help them in learning the course better.

6. There was no significant trend of change in students' reactions towards instructional strategy, and also their academic motivation over the period of experimentation. □□

The Concept of National Integration

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ONE of the national objectives of education of post-independent India is the achievement of national and emotional integration. Education has become the symbol of hope and confidence in the future of mankind. In modern society, education has received a new dimension that it should endeavour to relate it to the life, needs and aspirations of the people and thereby make it a powerful instrument for the realization of the national goals. Indian Education Commission has mentioned that, for this purpose, education should be developed so as to increase productivity, achieve social and national integration, accelerate the process of modernization and cultivate social, moral and spiritual values. Curriculum becomes the instrumentality by which the schools seek to translate our hopes for education into concrete reality.

A clear understanding of the meaning of national intergation becomes imperative if it has to be included in the school curriculum. The present study is an attempt to formulate a concept of national integration. An individual is emotionally integrated if he is well balanced, completely satisfied personality, whose urges, aspirations and emotions are sufficiently sublimated and directed towards fruitful channels, and who is sufficiently trained in the creed of temperance and tolerance. When we apply this in terms of nation, it means bringing about economic, social and cultural difference within tolerable range It does not mean doing away with one's own culture, rather respecting one's own culture as a part and parcel of Indian culture as a whole, i.e. realizing the unity in diversity. Thus, it is a multi-dimensional concept which includes social, economic and cultural aspects (Taneja 1971).

Operational Definition

Now, what are the elements, the presence of which in a person, we may say, mark the consciousness of national unity ? Acquisition of knowledge of resources, customs, cultural forces, etc. of the other parts of the country; developing certain concepts like tolerance of other religions, languages, customs, brotherhood feeling amongst all; creating interest on languages and literatures of, other than one's own, and development of certain values like spiritual, social, cultural, etc. in a person may mean national emotional integration in a person. Taking this operational definition as the basis, an opinionnaire was constructed to get the views of experts on national integration.

The Opinionnaire

Construction

On the basis of various definitions of national integration given by different thinkers, as reflected in the operational definition given above, an opinionnaire was constructed. The aspects were stated under the sub-headings of knowledge, understanding, attitude, interest and values. The objective here was to formulate a concrete and comprehensive 'norm' of national integration, which includes elements of knowledge, understanding, attitudes, interest and values, development of which in a person, may be identified as national unitary consciousness in that person.

A three-point attitude scale was constructed containing a number of statements to which the subjects were requested to respond The three points of the scale were : essential, necessary and not necessary. A specimen of the opinionnaire is given in a condensed form in Table 1. A total of 29 items were given under knowledge, 20 items under understanding, 12 items under attitude, 5 items under interest and 5 items under values.

TABLE 1

ILLUSTRATIVE ITEMS IN THE OPINIONNAIRE AND THE RESPONSES OBTAINED

Items	*Essential*	*Necessary*	*Not Necessary*
1	2	3	4
I. National Integration means the acquisition of certain elements of *knowledge*			
1. Knowledge of Rastra Bhasha	(16)	(12)	(2)

1	2	3	4
2. Physical features of different parts of the country	(5)	(19)	(6)
3. Vegetation and agriculture of different places	(3)	(13)	(13)
4. Mineral resources of different parts of the country	(3)	(13)	(14)
5. Social customs of the people of different places	(20)	(9)	(—)
6 Religions of different people	(10)	(14)	(6)
7. National movement of the country	(24)	(5)	(1)
II. National Integration means the development of certain concepts and *understanding* of certain terms			
1. Understanding of national heritage	(26)	(3)	(—)
2. Understanding that diversities are natural	(16)	(11)	(1)
3. Concept of patriotism	(21)	(7)	(2)
4. Concept of secularism	(19)	(10)	(—)
5 Cross-cultural understanding rather than sentimental attachment to one's own heritage	(13)	(13)	(3)
III. National Integration means development of certain *attitudes*			
1. Brotherhood amongst people	(24)	(4)	(1)
2. Coexistence with subcultures	(25)	(4)	(1)
3. Tolerance of different languages	(25)	(4)	(1)
4. Respect for national symbols	(17)	(10)	(—)
IV. National Integration means the development of certain *interests*			
1. Studying of other than one's own mother tongue	(17)	(11)	(2)
2 Reading different literature	(13)	(11)	(6)
V National integration means inculcation of certain *values*			
1. Democratic values	(19)	(10)	(1)
2 Cultural values	(21)	(9)	(—)
3 Aesthetic values	(10)	(11)	(9)
4. Ethical values	(15)	(10)	(5)
5. Spiritual values	(12)	(9)	(9)

Sample of Subjects

The opinionnaires were distributed amongst expert educationists in the city, especially in the Departments of Philosophy, Sociology, Languages and Faculty of Education of Osmania University. They were postgraduates, having teaching experience at college level of not less than five years and most of them had long research experience in the field of social sciences. Out of the 35 opinionnaires distributed for response, 30 were got back and analysed.

Analysis

The number of persons opted for a particular response is given against each item within brackets in Table 1. On some items the number of persons opting for two alternatives is very close. In such cases, should we accept the response of the 13 people and reject the other one ? Are we justified if we do so since the difference is so small that it may have arisen due to chance ? To resolve such doubtful cases, confidence level of more than 92 per cent were accepted as elements of national integration. The chi-square test represents a useful method of comparing experimentally obtained results with those to be expected theoretically on some hypothesis. All the items in the opinionnaire were statistically tested in this manner. Some illustrative results obtained are shown in Table 2.

TABLE 2

THE CHI-SQUARE TEST OF RESPONSES ON THE OPINIONNAIRE (ABRIDGED)

Item No.	*Essential*	*Necessary*	*Not Necessary*	*Chi-Square*	*P (from table)**	*Sigificant at .01 level*
1	2	3	4	5	6	7
I *Knowledge*						
1	16	12	2	10.4	0.01	Significant
2	5	19	6	12.4	0.01	Significant
3	3	13	13	6.7	0.04	Not significant
4	4	13	14	7.4	0.03	Not significant
5	2	16	12	10.4	0.01	Significant
6	3	21	6	29.0	0.01	Significant

1	2	3	4	5	6	7
II *Understanding*						
1	26	3	0	27.0	0.01	Significant
2	10	15	3	7.4	0.03	Not significant
3	16	11	1	11.8	0.01	Significant
4	21	7	2	19.4	0.01	Significant
8	13	13	3	6.7	0.03	Not significant
20	17	7	5	8.3	0.16	Significant
III. *Attitude*						
1	24	4	0	31.3	0.01	Significant
2	25	4	1	34.2	0.01	Significant
9	6	14	10	3.2	0.2	Not significant
IV. *Interest*						
1	17	11	2	11.4	0.01	Significant
2	13	11	6	2.6	0.25	Not significant
3	13	14	3	7.4	0.03	Not significant
V. *Value*						
1	19	10	1	16.2	0.01	Significant
2	21	9	0	22.2	0.01	Significant
3	10	11	9	0.2	0.90	Not significant

*See Garrett (1973)

Findings

From the analysis made, the following elements from the 'knowledge' sub-heading are found to be significant: Physical features, mineral resources, other natural resources, industries, trade and commerce, social customs of the people, social development, rituals followed by different people, important festivals, political history of different parts of the country, national movement of the country, great leaders in different fields, great writings of the country, great poets and musicians and educationists of different parts of the country. This shows knowledge of the above items should be acquired by a subject to develop feeling of national integration in him.

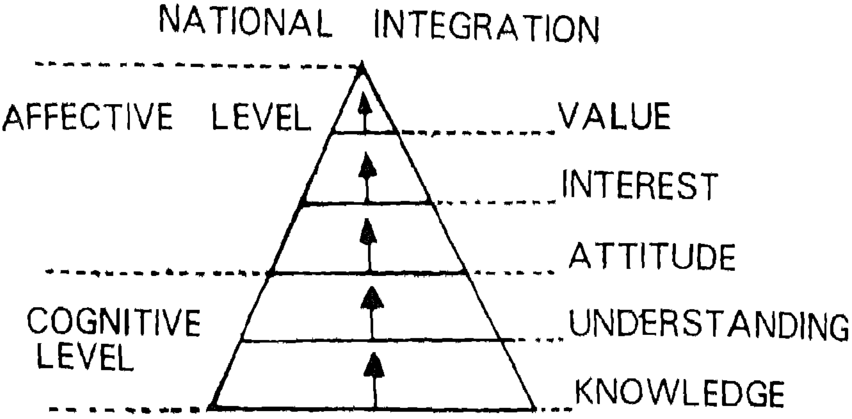
The following elements from the 'understanding' sub-heading are found to be significant. Understanding of national heritage, techniques of group-living, concept of patriotism, secularism, inter-cultural understanding amongst sub-cultures, ideals of democratic pluralism, social, economic and political justice, liberty of thought, expression, belief, etc. Equality of justice and opportunity, fraternity—dignity of the individual, awareness of commonness, different ways of meeting human needs and aspirations, realistic interpretation of cultural differences, mutual complementariness amongst people, inter-dependent community of India—these understandings should be developed in a person to create national feeling in him.

The following elements from the 'attitude' sub-heading are found to be significant· Brotherhood amongst people, co-existence with sub-cultures, tolerance of different languages, religions and culture, respect for dignity of man, open-mindedness, dependence among different regional standards, inculcation of democratic method and outlook and respect for equality of opportunity for all That means peoples who have developed these attitudes in them on the basis of the knowledge acquired and the understanding developed as mentioned above.

From the 'interest' sub-heading, elements like, interest about sub-cultures, specifically, studying of other than one's own mother tongue; and from 'values' sub-heading, elements like, democratic values, and cultural values are found significant.

Discussion

National integration means "acquiring the basic values,· ideals and the pattern of living of other sub-cultures in such a way as to effect an appreciative understanding and cooperation with the members of other groups" (Thirtha 1964). Acquiring knowledge of another sub-culture helps the individual to articulate or to internalize the articulated structure of the other groups. This *cognitive* learning leads to *affective* learning which means 'the ability to respond to feelings, say with love and sympathy, to situations, behaviour and their attendent values and attitudes of sub-cultures' (Thirtha 1964) Hence promotion of national integration means attainment of both these cognitive and affective aspects of learning. If it is arranged in a hierarchical form,'knowledge' comes at the bottom which is the basic pre-requisite of national integration. From this develops 'understanding', the next stage. These two together form the 'cognitive level' of integrated national consciousness. The third higher stage is the formation of favourable 'attitudes' ; next to it is the creation of certain interests and lastly, the inculcation of certain values in the individual. So creation of certain values and appreciation of values is the culminating point when we say that integrated consciousness has been achieved. These three--attitude, interest and value—together form the affective level of national integration. Hence the attainment of only cognitive level will not lead to integration. Attainment of affective level is the attainment of national integration proper. This is illustrated in the figure below :



Hierarchical Order of the Elements of National Integration

According to the Committee on National Integration (1962), 'emotional integration is the core of national integration'. It emphasizes the pattern of group loyalties in the country with dynamics of school approached. Precisely speaking, every element in the educative process--aims, curricula, i.e. both the syllabi and the activities technique, organization and the educator—can be so geared that it activates the process of integration

Conclusion

1. National integration is a multi-dimensional concept which has social, cultural and psychological implications.
2. Cognitive learning and affective learning taken together mean the attainment of national integration.
3. From the hierarchical arrangements of the elements, illustrated in the figure, it is said that emotional integration is the core of national integration.
4. To attain this emotionally integrated feeling, the aim of education, curricular and co-curricular activities in the schools, instructional methods followed in the schools and, above all, the attitude of the

teachers should be oriented accordingly. Thus, curriculum is the instrument to achieve the desired goal of education in general, and promotion of national and emotional integration, in particular.

Further Studies Proposed

On the basis of the above findings and conclusions in regard to elements of national integration, further studies are to be conducted to find out how far the syllabi, the instructional methods, the co-curricular activities introduced in schools are geared to improve the feeling of national integration in the minds of the younger generation.

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Promotion of Creativity and Achievement by Discovery Method

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THE SUBJECT OF creativity has been the centre of attraction for number of research workers in the field of education. Various authors have applied different methods for the promotion of creativity in different disciplines.

Discovery method is one of the potential methods for the generation of creative talents in the students of the different age-groups. Jafri, *et al.* (1972) applied this method for teaching physics to undergraduate students. Their results have revealed that the performance of the experimental group was much superior to that of the control group. Wood, *et al.* (1976) have also studied the effects of different teaching styles on creativity. Their study also shows that there occurs a significant increase in creativity of the children taught by interaction analysis method than for the children educated by traditional method. In the present paper, the author has applied this method for teaching physics to high school pupils in which the theory course was integrated with laboratory work.

Selection of Students

In order to select the sample for the application of discovery method, culture fair intelligence and achievement tests were conducted on two sections of Class IX of the Kendriya Vidyalaya, Flour Mill, Bhopal. The achievement test was developed by the author. The results of these tests were analysed for selection of two groups of students. On the basis of the scores obtained in IQ and achievement tests, 12 students of one section were matched in pairs with 12 students of the other section. One group of 12 students was labelled as 'experimental group' while the other was named as

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*The author is grateful to Prof. S.N Tripathi, RCE, Bhopal, for his valuable guidance and suggestions without which the present work would not have been possible Thanks are also due to the Principal, Kendriya Vidyalaya, Bhopal, for providing necessary facilities in the school.

'control group' The results of two groups in respect of IQ and achievement tests were as follows :

1.	Mean IQ of the experimental group	97.83
2.	Mean IQ of the control group	97.58
3	Mean achievement score of the experimental group	23 16
4	Mean achievement score of the control group	23.75

The scores in achievement test for both the groups were analysed for *t*-test of significance and *t*-value was found to be 0.26 which is insignificant at 0 01 level. Further, two groups of students formed as above were subjected to a verbal test of creativity developed by Mehdi (1973). The scores for fluency, flexibility and originality for the two groups were converted to *t*-scores as explained by Garrett (1973) and were analysed statistically The results are shown in Table 1.

TABLE 1

MEAN, S.D AND *T*-VALUE FOR FLUENCY, FLEXIBILITY AND ORIGINALITY OF TWO GROUPS IN CASE OF PRE-TEST OF CREATIVITY

S. No	*Divergent Production Abilities*	*Experimental Group*		*Control Group*		*t-value*
		Mean	*S.D*	*Mean*	*S D*	
1.	Fluency	49 577	9.65	50.42	10 326	0.198
2.	Flexibility	49.25	10.324	50.746	9 612	0 352
3.	Originality	50.002	10 93	49.169	7 763	0 206

It may be seen from Table 1 that the *t*-values for all the three abilities are not significant at 0.01 level. Thus, initially the two groups of the students were equivalent in those aspects which were most closely connected with the problem under investigation.

For the purpose of the present study, only 24 students were selected. Since the experimental group was to be taught by discovery method, therefore, it was necessary to provide maximum facilities to the students in the laboratory In general the laboratories in most of the schools in our country do not possess sufficient apparatus so that each student can perform experiments individually. Therefore, normally students do experiments in groups only In order to avoid such difficulties, the investigator has restricted her present study to a small sample of 24 students consisting of two groups.

Teaching Schedule

Since the teaching without testing creates communication gap among the pupils, so in the experimental group teaching and testing went together. Students were given sufficient freedom for self-directed thinking by asking probing questions in between the teaching process. This has not only minimized the communication gap between the teacher and the taught but also created confidence in pupils and infused a critical thinking in pupils. This has promoted better understanding and the students appreciated the interconnection between analysis and experimentation. There was complete freedom of thought and action in the classroom and laboratory.

'Light' unit of physics meant for high school pupils was selected for teaching purpose. Though separately, but both the groups were taught the same theory course. These three chapters of the Light unit were taught: (*i*) Plane and Spherical Mirrors, (*ii*) Refraction, (*iii*) Lenses.

To introduce each topic to the experimental group, a situation was provided in which the students could identify the problem. The students were stimulated to find the solutions. Consultation of literature in the library and frequent discussion with teachers and classmates were encouraged. Students were also given guidance as and when they required. Facilities for simultaneous experimentation in the laboratory were provided based on what they learnt in the class and outside. The students performed several experiments, prepared records and drew conclusions.

The attempts of the experimental group to investigate the solution to any problem were based on the following lines :

1. Indentifying the problem
2. Defining the problem
3. Collection and interpretation of data
4. Formulation of possible hypothesis
5. Testing the hypothesis by experimentation and observations
6. Communication of results of experiments

In other words, the students of the experimental group initially looked at the gravity of the problem and proceeded further to frame the hypothesis with all the possible solutions in mind. Each student had put maximum efforts in collecting the material and participated in discussions which helped them in accepting a particular hypothesis. Students of this group performed experiments themselves by collecting the required apparatus from the laboratory and did the analysis for drawing the conclusions. Although physics practicals as a course are taught only from Class X onwards, yet the students of Class IX taught by discovery method could perform a number of experiments Since the students were given full freedom to play with the apparatus, they could exercise their maximum talents and were able to do many experiments in spite of short span of time provided to them As an example, the phenomenon of reflection and the laws of reflection were taught to the experimental group by discovery method in the following way.

In order to provide a situation in which the students may feel the need of asking some questions, the investigator demonstrated an experiment to the students to show that a beam of light, when falls on a plane mirror, comes back in a different direction. To perform this demonstration, the investigator took a torch and allowed the beam of light emerging from it to fall on a plane mirror in a dark room. The beam comes back in a different direction than the incident. The students observed the demonstration carefully. Then the investigator went on changing the direction of the incident beam, and the students observed the simultaneous change in the direction of the reflected beam. The students at once sensed a problem themselves for finding out the reason and explanation of what they have seen. The students were asked to define the problem. They could define the problem in the following ways :

1. Why is the image of the torch seen ?
2. Why does the beam of light come back ?
3. Why does the beam come back in a different direction than that of incident beam ?
4. Why does the direction of reflected beam change with the direction of incident beam ?

Of all the above statements, the last one was in fact the problem which was to be solved. After discussion, the last statement was accepted as the problem and the students started analysing it. The teacher suggested various references related to the problem. The students consulted the references and collected evidences bearing upon the problem. After collecting sufficient information about the phenomenon of reflection with plane mirror the students proposed a number of hypotheses, e.g. :

1. When a ray of light falls on a plane mirror, it is reflected in a different plane.
2. The angle of reflection is less than the angle of incidence.
3. The angle of reflection is greater than the angle of incidence.
4. When a ray of light falls on a plane mirror, it is reflected in the same plane, making an angle of reflection equal to the angle of incidence.

After forming possible hypotheses, the students performed experiments to test the above hypotheses. The students could select the most appropriate hypothesis by rejecting others through discussions and experimentations. Finally, the students could draw conclusion and communicated the result that hypothesis (4) is the correct solution of the problem. On the other hand, the control group was taught by the traditional method by the regular teacher of the school. The students of this group could do only a very limited number of experiments. The related apparatus was set in the laboratory by the laboratory assistant and students could just record the observations under the guidance of the teacher.

Data Collection and Analysis

After completion of the teaching progamme, the investigator conducted post-tests for creativity and achievement on both the groups of students. The post-tests for creativity and achievement were developed by the author. The achievement test was based on the unit 'Light' which was taught to the students during the teaching schedule. The reliability of the above-mentioned creativity test has already been tested. The creativity test consisted of eight tasks which tested the following abilities of the students :

1. Divergent production of symbolic systems
2. Cognition of semantic implications
3. Divergent production of semantic classes
4. Divergent production of semantic units
5. Divergent production of figural flunency

In order to find the ability of the students to frame the hypotheses, to test the hypotheses by experimentation and observation and to communicate the results of the experiments, a practical test was also taken. The practical test was conducted under the supervision of regular teacher of Kendriya Vidyalaya, as an external examiner.

With a view to compare the achievements of the experimental and control group, the total scores obtained by the students in theory and practicals have been analysed statistically. The fluency, flexibility and originality scores obtained as a result of creativity test have been converted to t-scores. The t-scores, so obtained, have been subjected to the test of significance.

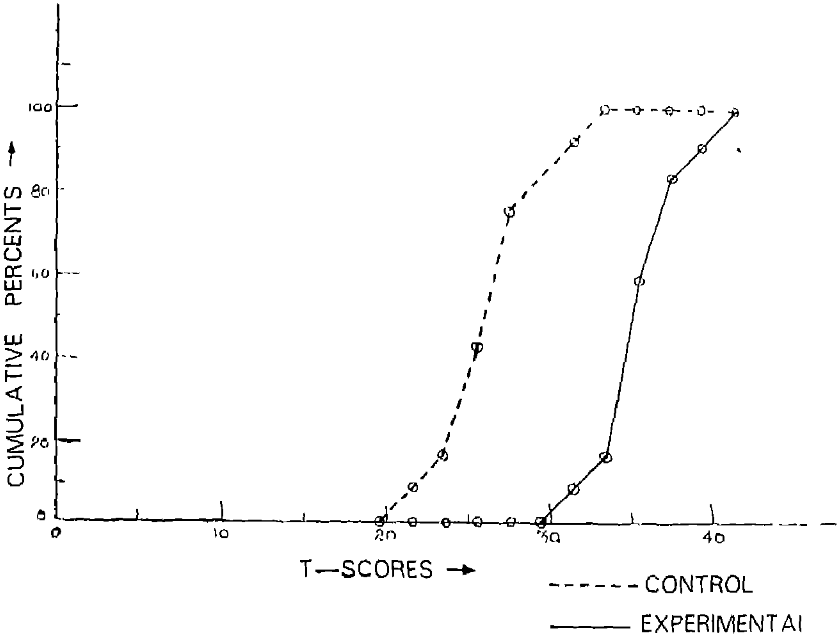

FIG. 1 : Ogives representing scores made by experimental and control group on post-achievement test in physics

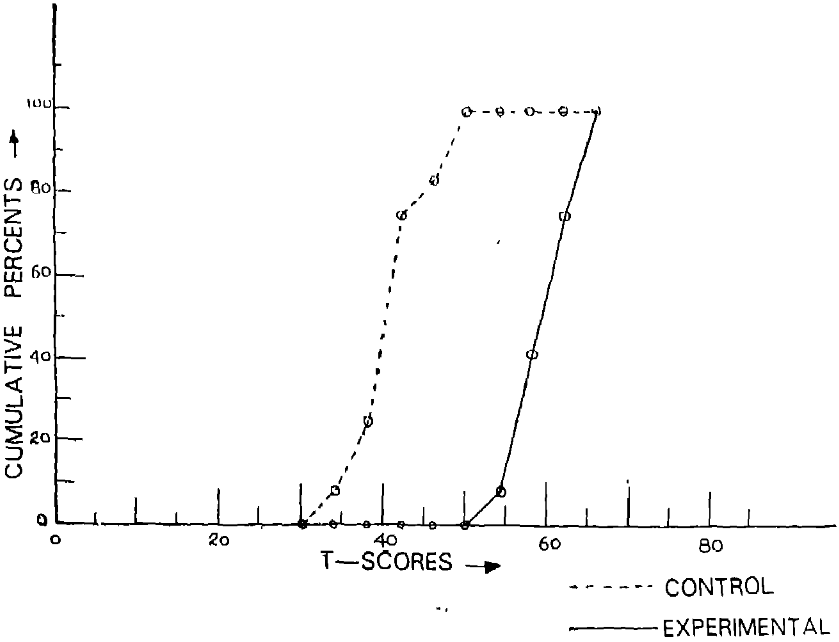

FIG. 2 : Ogives representing *T*-scores for fluency made by experimental and control group on post-creativity test

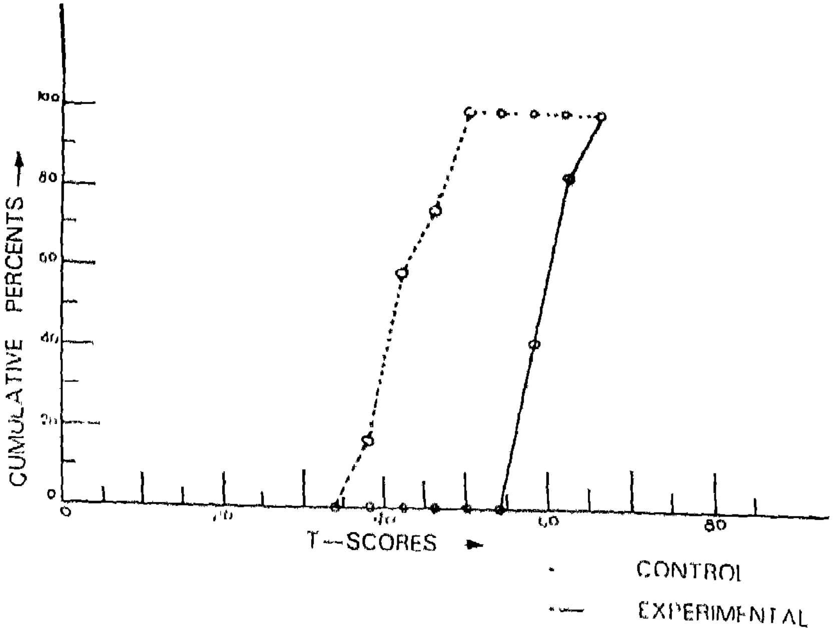

FIG. 3 : Ogives representing *T*-scores for flexibility made by experimental and control group on post-creativity test.

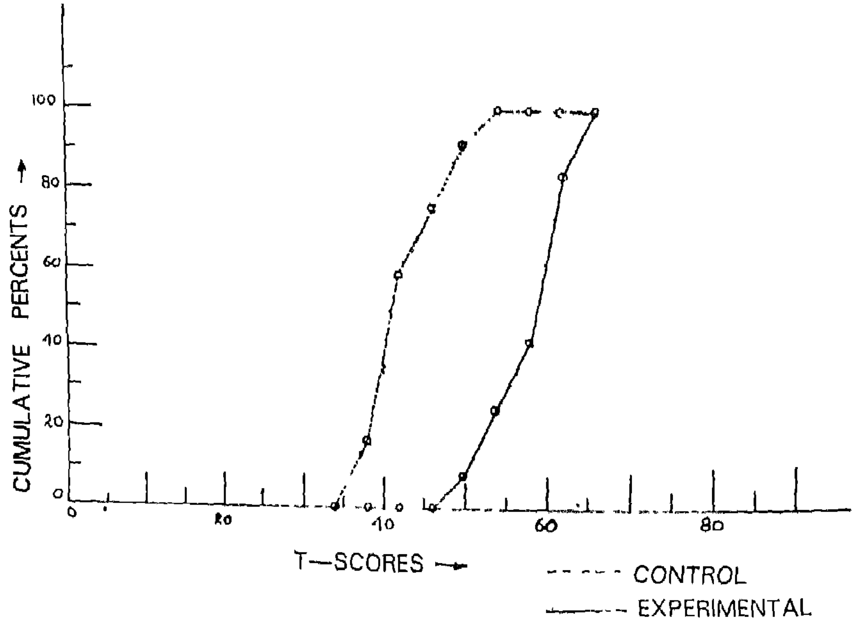

FIG. 4 : Ogives representing *T*-scores for originality made by experimental and control group on post-creativity test.

Results and Discussion

The results of the achievement and creativity tests have been presented in tabular and graphical forms. The results obtained from post-achievement test conducted on two groups are : (*a*) Mean achievement of experimental group—35.41, (*b*) Mean achievement of control group—26.33. The scores obtained have been analysed statistically and the *t*-value has been found to be 7.834 which is highly significant at 0.01 level This implies that the achievement of the experimental group is superior over the control group.

Table 2 shows the mean, the standard deviation and the *t*-values for fluency, flexibility and originality scores of the two groups obtained from the post-creativity test In all the three cases, the *t*-values are highly significant at 0.01 level which is an indication of the effectiveness of the discovery method over traditional method.

TABLE 2

MEAN, S D AND *T*-VALUE FOR FLUENCY, FLEXIBILITY AND ORIGINALITY OF TWO GROUPS IN CASE OF POST-TEST OF CREATIVITY

S. No.	*Divergent Production Abilities*	*Experimental Group*		*Control Group*		*t-value*
		Mean	*S.D*	*Mean*	*S D*	
1	Fluency	59.066	3.639	40.998	4.733	10.076
2.	Flexibility	59.266	3.01	40.732	4.209	11.889
3	Originality	57.903	4.646	42.108	5.358	7.39

The Ogives representing achievement, fluency, flexibility and originality of the two groups have been presented in figures 1,2,3 and 4, respectively. The curve for the experimental group is on the right side of the curve for control group in each case. It is clear from the figures that scores in case of the experimental group are higher than that for the control group. In other words, the students taught by the discovery method show a significant improvement in achievement and creativity over the other group which has been taught by the traditional method.

Conclusions

It is evident from the present study that one of the basic abilities that should be taught in our schools is the ability to discover, to search answers instead of passively waiting for answers and directions from the teacher. In other words, for awakening the faculties of creating thinking in pupils, learning by discovery method should be encouraged. Therefore, the class-room procedures should emphasize the discovery of both problems and their solutions by the students themselves. If it is impressed upon pupils that there are many ways of reaching a solution to a given problem, they will then try to respond in a variety of ways to the same situation. This is nothing but a preparation for future creative action.

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Parental Deprivation in Relation to Academic Achievement of Denotified Tribes

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WE FIND DIFFERENT VARIATIONS in the society One dimension of variation in the society is deprivation. Some are enjoying the parental life while the others are deprived of it. The death of either or both of the parents is a sure criterion of identifying deprivation. The separation of a child from the parents may be permanent or temporary. The effects of long-term or permanent separation from one or both of the parents are more complex. In this type of separation the child may have greater difficulty in adjusting to the changes of his life-situation

Deprivation in children is a result of these causes : maternal deprivation, faulty mother-child relations and poor economic conditions. All these conditions may cause a deprivation of the needs of love, affection and warmth, essential for the personality development of the child. The effects of early deprivation on children have been shown most diagrammatically in studies of infants in institutions. Institutions today vary considerably in their facilities, but even good institutional care is likely to fall short of a desirable home environment which guarantee stimulation, guidance and affectional relations. The effects of one modern institutional environment as contrasted with the home environment were studied by Provence and Lipton (1962). They contrasted the deprived children with that of adequate mothering and general stimulation. Children who achieved adequate maternal care develop much and learn many things. They can communicate their wants and feelings in a variety of ways. The deprived group shows no signs of strong attachment to any one person, nor any signs of the development of a sense of trust in the adults who cared for them.

Therefore, we can find out that deprivation, the form of isolation, refers to the conditions under which the child enjoys normal or at least fragmentary social experiences with peers until some or pre-destined time, when the gates of mercy and social meaning are closed and the child is left to grow up in a confine devoid of the companionship or lingering forms. In these cases, separation from social partners and peers become the primary factor altering the emerging personality. Thus it can be concluded that deprivation has far-reaching influence on the personality of the children. Adjustment and other personality factors have been found out to be intimately associated with success or failure in academic achievement.

Academic achievement here is defined as the mean achievement scores in the examination of each subject, i e, curriculum of the students taught by the teacher The present research was planned for a similar purpose to study on a fairly large sample of institutional children (tribal children living in Ashram-type school hostels and as such deprived of parental affection and care). It is worthwhile to discuss in brief about the denotified tribes.

The denotified tribes people have functionally been defined as a group of people who have been declared by the government as that segment of population which is backward economically and sociologically and for whose assistance special programmes have been instituted. There are about 550 tribes and sub-tribes in different parts of India classified as Scheduled Tribes in accordance with the revised schedule published in the Scheduled Caste and Scheduled Tribes Order Amending Bill No. 119 of 1967.

The study of denotified tribes is important because the tribal communities of India were in a state of isolation for many centuries and they led a life of their own uninfluenced by the outside world. This isolation of the tribal people was responsible for the development of a homogeneous and closed society having a self-sufficient economy, their own customary laws, animistic attitude and also loyalty to their own village headman and chief leading to tribal solidarity.

The denotified tribal children come from very poor families. All the members of the family, adults as well as children, go out for work to earn their livelihood. So the adults are not interested in allowing their children to go to the school Even if some of them do go to the school, these starving children are not likely to go through any kind of meaningful education in the pre-school or regular school situations.

Factors Influencing Academic Achievement

There are several factors which may affect students' achievement : age, study habits, teaching and learning methods, socio-economic factors and biographical data Age of the students has also been studied as a factor in determining the academic achievement. Maller (1932) in a study established that age is related to academic achievement. Carter (1948) in a study has found some correlation between method of learning and achievement. Jamuar's (1963) study indicated that the study habit was related to scholastic achievement. The study habit was not dependent upon intelligence but it was an additional factor underlying scholastic achievement It was found to be related to general personality adjustment—home, health, social and emotional. While it has no relationship to extraversion or introversion, it bore positive relationship with other background factors like position in the family, father's occupation, hobbies and future vocational and educational plans of the students And an inverse relationship with such factors as age, membership of organizations outside college and sharing household duties

Adjustment is also studied as a predictor of students' achievement. In a study made by Barkat (1951) it was reported that emotional irritability is related to the success of students in the mathematical test Misra (1961) found the low achievers to be significantly high on anxiety. The findings of Sinha (1965) show that high achievers have high IQ, low anxiety and better adjustment in all fields than those of low achievers. Motivation is also found to be related to academic achievement

From the above discussion it is seen that there are certainly some other factors which affect students' achievement. Washburne and Hail (1960) have remarked that teacher's personality has a marked effect on pupil's academic and social progress They also hold that there is an interaction between the type of teacher and children's emotional adjustment, which ultimately may affect the learning of the students.

Devos, *et al.* (1974) have remarked that achievement or accomplishment itself can be a form of personal validation. In this sense, achievement must be considered to be motivated by some psychological patterning that guides behaviour according to value system. Bradburn (1963) suggests that the father's role is more important as he formed duty of responsiveness among their children. Thus, we can say, that so far a need for achievement is regarded in relation to deprivation, the role of parents is much important in making the personality of the child.

Methodology

A sample of 587 students consisting of boys and girls was selected from the Government Ashram-type schools and other schools and colleges of U.P. For comparing the academic achievement of denotified tribes' children, a sample on non-tribal children was also chosen. The range of students was from Class VIII to intermediate standard (Class XII). Students from three academic groups—arts, science and commerce—were included in the sample.

The independent variable of the study was parental deprivation and dependent variable was academic achievement. The groups were matched on the variables of age, sex and educational standard. The syllabus was uniformly applicable in both the schools. Other relevant variables were also controlled as far as possible. The total marks obtained by the students in his/her half-yearly examinations were taken as indicative of his/her academic achievements, since annual examination marks were not available at the time of the visit of the researcher to the schools.

In the present system of education the criterion used is that those who secure 60 per cent marks and above are placed in first division, 45 per cent marks and above but below 60 per cent marks get second division, less than 45 per cent up to 33 per cent marks are placed in third division.

Conclusion

The conclusion of this study is that parental deprivation has an adverse effect on the academic achievement of the students. Present findings may be caused by a number of factors. Motivation is also one of them. For achievement major emphasis should be given to motivational response. For example, the motive of a need for achievement has been explored in detail (Atkinson 1964, Birney 1968, Maclelland, Atkinson, Clark and Lowell 1953; Maclelland 1961). In these studies it is concluded that the individual of high motive tend to strike with greater efforts and devotion to the attainment of goals. Recent studies by Das (1968), Rath (1974) and Sinha (1976) have demonstrated that the academic performance of scheduled caste and upper caste children significantly differ on some cognitive and perceptual tasks. However, in these studies no adequate criteria of measurement of deprivation have been attempted. Therefore, it can be said that the performance of parental group children appeared to be more achievement-oriented than the other group in that context. From the present discussion it is clear that for parental groups children's achievement motivation plays an important role.

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Achievement and Errors in Book-keeping of Regular and Correspondence Students of Rajasthan : A Comparative Study

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AMONG the commerce subjects studied at various stages, book-keeping and accountancy has acquired a unique position. It is a practical subject which requires proper understanding of the principles for recording business transactions and the skills inherent therein While learning of principles and their application, the students may commit certain errors and, therefore, some remedy is to be provided for these errors. From the point of view of skill development and accuracy, the errors committed by the students may be analysed and categorized. This will enhance the achievement of students and the instructional programme may be strengthened.

The Problem

The Board of Secondary Education, Rajasthan, evaluates two types of students, regular and correspondence, at the higher secondary examination The instructional programme for regular students is different from that of correspondence students. The course is the same for them. The regular students are taught in organized classroom setting, having direct interaction between the teacher and the taught. But for correspondence students there is no direct and regular contact between the teacher and the taught except for 10-15 days in a year. The instructional requirements are fulfilled through correspondence by sending lessons But the nature of the subject needs direct involvement of the teacher in the form of supervision, demonstration and guidance. Therefore, the achievement of regular students in book-keeping may be more in comparison to that of correspondence students. The correspondence students may commit more errors in comparison to regular students. Hence, the investigator chose this problem for further investigation.

Operational Definitions of Variables

(*a*) *Regular Students* : Students, who were on the roll of schools affiliated to the Board of Secondary Education, were called regular students (subjects).

(*b*) *Correspondence Students* : Students who were on the roll of the correspondence course students' Register of the Board were termed as correspondence students (subjects).

(*c*) *Achievement* : It indicates the scores of marks obtained by the students in the final examination of the Board.

(*d*) *Errors* : The meaning of errors implies deviation from standard and acceptable pattern of answers as per book-keeping principles and norms suggested by the Board.

Objectives

The objectives of the investigation were as follows ·

1. To compare the achievement of regular and correspondence subjects (students).
2. To compare the errors committed by regular and correspondence subjects (students).
3. To find out the types of errors committed by regular and correspondence subjects.
4. To suggest measures for improving teaching and learning of book-keeping for regular and correspondence subjects.

Delimitations

The investigator made the following delimitations of the study :

1. The answer-books of the first paper in book-keeping (1977) were selected for this study.
2 Multiple-choice items were not taken into consideration for the study of errors.
3. One hundred answer-books of the subjects of Ajmer district, 50 each for regular and correspondence subjects, were taken up as sample for this study. The answer-books were provided by the Board

Hypotheses

The following hypotheses were formulated :

1. The achievement of regular subjects is more in comparison to that of correspondence subjects.
2. The regular subjects commit less errors in comparison to correspondence subjects.

Procedure

A *Selection of Students*

One hundred students (50 regular and 50 correspondence) were selected on the basis of stratified or quota smpling. For each group 25 students were taken from rural areas and 25 students from urban areas This was done to make the study more representative and to make the findings more reliable.

B. *Methods, Techniques and Tools*

Methods : The investigation was based on normative survey method having comparative study taking into consideration 'document analysis' (answer-books of subjects).

Techniques · The errors as revealed by answer books of the subjects were categorized and analysed. The achievement of the subjects was analysed on the basis of quality and quantity, i.e. on the basis of divisions obtained and the pass percentage of regular and correspondence subjects.

Tools : The research tools for data collection were observation and interview. The answer books were observed by the investigator. The tutor of the Board and the examiners of regular subjects and correspondence subjects (sessional work) were interviewed to know the type of errors committed by subjects, and the tentative difference in their achievement standard. Examiners' reports were also consulted to know the views of examiners about the achievement and errors of the subjects in book-keeping.

C. *Data Collection*

The data was collected on the mechanical evaluation sheet developed by the investigator after examining some answer-books of the subjects from every strata The data regarding achievement was taken from the tabulation registers of the Board. The errors committed by the subjects were taken from the answer books. The question paper was thoroughly studied by the investigator. There were 11 questions in Section A (excluding multiple-choice items) and seven questions in Section B.

Analysis of Achievement and Errors

TABLE 1

ACHIEVEMENT OF REGULAR AND CORRESPONDENCE SUBJECTS

Subjects	Div. *I*	*II*	*III*	*Pass*	*Fail*	*Marks Obtained*	*N*	*Mean*
Regular	20	14	15	49	01	1359	50	27.18
Percentage	40	28	30	98	02	50.36		
Correspondence	07	17	09	33	17	1013	50	20,26
Percentage	14	34	18	66	34	40.52		

Table 1 reveals that the mean score of regular subjects (27.18) exceeds the mean score of correspondence subjects (20.26) by 6.92. There are 13 more first divisioners in regular subjects as compared to the correspondence subjects. The pass percentage of regular subjects exceeds that of correspondence subjects by 32. This shows that the performance of regular subjects is better than that of correspondence subjects in both quality and quantity.

The errors committed by regular and correspondence subjects were classified and categorized on the basis of the mechanical evaluation sheet. These subjects committed eight types of errors pertaining to concept (C), understanding (U), rules (R), procedure (P), proforma (PF), arithmetic (A), spelling (S), and miscellaneous (M).

Table 2 shows comparison of errors between regular and correspondence subjects. It reveals that regular subjects committed 535 less errors than correspondence subjects. These errors were categorized after examining the answer-books of subjects. Every error was given one tally. Regular subjects committed less errors in seven categories. This shows that regular students understand the concepts, principles and procedures better than correspondence subjects.

TABLE 2

ERRORS COMMITTED BY REGULAR AND CORRESPONDENCE SUBJECTS

				Errors					*Total*
Subjects	*C*	*U*	*R*	*P*	*Pr*	*A*	*S*	*M*	*Errors*
Regular	474	292	108	303	142	117	129	47	1617
Percentage	29	18	07	19	09	07	08	03	
Correspondence	693	431	126	391	156	168	150	37	2152
Percentage	32	20	06	18	07	08	07	02	

Statistical Inferences and Interpretation

TABLE 3

ACHIEVEMENT STATISTICS OF REGULAR AND CORRESPONDENCE SUBJECTS

Subjects	*N*	*Mean*	*SD*	SE_d	'*t*' (*df*) 98	*P*
Regular	50	27.18	7.24	1.64	4.22	Significant at .01
Correspondence	50	20.26	9.05			

Table 3 reveals that the mean difference in scores between regular and correspondence subjects (27.18 − 20.26) is 6.92 and the standard error of the difference between means (SE_d) is 1.64. The obtained value of 't' for df. 98 at .01 level, being one-tail test, is 2.36 which is less than the obtained value of 't'. Hence, the Ho is rejected in favour of regular subjects. It is inferred, therefore, that the achievement of regular subjects is significantly higher than that of correspondence subjects. The formulated hypothesis that the achievement of regular subjects is higher in comparison to that of correspondence subjects is accepted.

Since there is dearth of research evidences which can support or contradict the obtained results of the study, the adoption of phenomenological approach may prove useful. It may, therefore, be stated on the basis of day-to-day experience of a teacher that direct and continuous interaction between teacher and the taught in classroom situation helps in improving the achievement of regular subjects in terms of better understanding of concepts, principles, procedures, etc. than that of correspondence subjects.

TABLE 4

STATISTICS OF ERRORS COMMITTED BY REGULAR AND CORRESPONDENCE SUBJECTS

Subjects	*Ranks*	*U*	*Calculated value of 'Z'*	*Tabulated value of 'Z'*	*Ho rejected in favour of*
Regular	2099.5	1675.6	3.395	0003	Regular
Correspondence	3017.5	757.5			

U=Mann-Whitney U Test (Siegel)

Table 4 reveals that the sum of the ranks of errors assigned to regular subjects (2099.5) is less than the sum of the ranks of errors assigned to correspondence subjects (3017.5). The 'Z' value of the calculated 'U' is 3.395. As per table 'A' (Siegel) Z (3.395 has a one-tailed probability under Ho of p .0003. Since this p is smaller than .01, the Ho is rejected in favour of regular subjects. Hence, the formulated hypothesis that the regular subjects commit less errors in comparison to correspondence subjects is accepted.

On the basis of empirical experiences of a teacher it may be stated that regular subjects commit less errors due to proper understanding of concepts and principles of book-keeping than correspondence subjects.

Suggestions

Book-keeping Teachers

On the basis of the findings of the study the teachers may be advised to pay more attention on the understanding of concepts, rules, procedures, etc. by the students. Sufficient practice to the students should be given for improvement. They may be advised to study carefully the corrections carried out in the home assignments. This will inculcate the habit of correct understanding of principles and concepts among students. The teachers may discuss the examiners' report in the class to draw the attention of the students towards the errors committed by them in book-keeping.

Regular Students

Regular students should pay more attention to the black-board work done by the teachers. It will minimize the errors committed by them regarding the proforma and the procedure. Instead af craming the rules, 'Why' of book-keeping should be stressed. They should thoroughly go through the checked home assignment to avoid the same errors in future

Correspondence Students

The students have committed more errors regarding concept, procedure, rules, etc For proper understanding of skill subject like book-keeping they should follow the rules and go through the comments made by their examiners on the model answer-books During contact programme they should be very particular about the procedure and the proformas for different kinds of accounts in book-keeping.

The Board

The contact programmes for the correspondence students may be oragnized twice a year. The programmes should include only those units which require personal dialogue between the teacher and the students.

Conclusion

On the basis of the findings of this study it may be concluded that the achievement of regular students is higher and they have committed less errors in comparison to the correspondence students. The educational implications of the findings may be useful for future learners of book-keeping. The suggestions may be implemented for better teaching and learning of book-keeping.

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Job Satisfaction versus Work-Role Variables

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POSSESSION OF A SOUND mental health has been accepted to be an essential prerequisite for an effective teacher. Teacher's sound mental health pertains to his best of adjustment within himself and his surroundings. Obviously, the teacher manifests his mental health in the feelings of satisfaction and dissatisfaction at his job. The optimum level of efficiency is attained by the teacher by virtue of his being satisfied at his job whereas on the contrary dissatisfaction hampers his functioning to any useful purpose. Satisfaction identifies the teacher with his profession and dissatisfaction keeps him in ever-readiness to get out of it at the earliest available opportunity. In the phenomenon of teacher-pupil interaction, i.e. education, it is but of fundamental importance that the teacher should cherish desirable mental health so as to facilitate the children, entrusted to his guidance, acquire sound mental health, that is, the smooth all round development of personality which remains to be the ultimate aim of education.

In their surveys of literature on job satisfaction, Vroom (1964), Rohilla (1966), Dwivedi (1977) and Anand (1977) have come to the conclusion that any explanation of job satisfaction requires the use of both work-role and personality variables. These two sets of variables are recognized as interacting with each other influencing and determining one's job satisfaction. Both the mentioned variables need to be studied simultaneously rather than in a piecemeal way exclusive of one or the other.

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* The author is grateful to Dr. R.N. Mehrotra, Professor of Education, Central Institute of Education, Delhi and Dr. D.R. Vij, Principal, Government College of Education, Jullundur, for their expertise made available in the preparation of this paper.

Objectives

The present investigation attempts to study teachers' job satisfaction in relation to the following variables :

1. Work-Role Variable(s) : States in which teachers are working, qualifications, subjects of teaching, age and teachers' training
2. Personality Variable(s) : Sixteen personality factors as revealed on 16 P.F. questionnaire (Cattell).

However, in this paper, the analysis of first variable has been produced. The analysis on the second variable will be reported in the second paper.

Sample

The sample includes 999 teachers (507 trained and 492 B.Ed. trainee-teachers) teaching various subjects in different schools of the eastern states of India. The sample of trainee-teachers has been included only to compare *the job satisfaction of trained and trainee working teachers.*

Tools

The following two questionnaires have been used in this study.

1. Job Satisfaction Scale by Anand (1972).
2. Sixteen Personality Factor Questionnaire by Cattell (Form A, 1967-68).

Analysis and Interpretation

The immediate perusal of the frequency Table 1 shows that the distribution of scores on job satisfaction scale follows a normal distribution pattern. It is found that out of 507, 335 (66.07 per cent) teachers fall in the middle range of the frequency table in the class intervals of 60 to 89 of the distribution. There are only 49 (9.66 per cent) teachers who fall at the tail end of the distribution and 123 (24.26 per cent) teachers occupy the higher limits of the distribution The values of 78.92, 80.45, 83.51 and 14.60 for mean, median, mode and standard deviation, respectively, of this distribution also substantiates the 'nearly normal distribution pattern' followed by the sample on the job satisfaction scale. A very small skewness - .32 further gives additional evidence to our inference about the distribution of job satisfaction scores.

Job Satisfaction Scores of Teachers

The means and standard deviations of job satisfaction scores of the teachers of different states have been recorded in Table 2. It has been found that these mean scores of the teachers of almost all states revolve around the digit of 80. This revelation falls in line with the author's earlier studies (1972, 77) which actually had led to form the basis of taking a minimum score of 80 on this scale to adjudge the teacher satisfied at his job. It is further gathered that there is no significant difference between the mean scores of teachers of different states. It may be inferred that job satisfaction enjoyed by teachers is not influenced by the states in which they are working. This is further corroborated by the insignificant value of chi-square ($\chi^2 = 14.11$ for df = 24), calculated by applying the test of independence on Table 1. Even for the contingency Table 3, chi-square is found to be only 3.22 for 3 degrees of freedom which is not significant. It shows that the number of teachers found satisfied do not depend upon the states in which they are working. We may acknowledge it a welcome finding that job satisfaction/dissatisfaction of teachers can hardly be attributed to the geographical boundaries of their working places.

However, in the case of Orissa, it is found that as much as 50 per cent teachers are not satisfied. This overall position is also far from being, satisfactory. It is here that we are constrained to think about the role the teachers can play especially in assisting the children entrusted to their guidance for attaining sound mental health. The question may fall in the purview of philosophy, sociology or psychology, but it is very pertinent to penetrate into the minds and hearts of 'life makers' to rationalize the ailing factors of the mental health of teachers.

Job Satisfaction and Subjects of Teaching

To find out the association between the job satisfaction scores and the subject of teaching of the teachers, chi-square test of independence was applied on the contingency Table 4. The chi-square has been calculated to be 26.66 which is not significant for 40 degrees of freedom. It may be inferred that these two variables are independent of each other. The question was further analysed in the case of teachers of different subjects belonging to Orissa

TABLE 1

JOB SATISFACTION SCORES OF TEACHERS FROM DIFFERENT STATES

Scores	*Orissa*	*Bengal*	*Bihar*	*Other States**	*Total*
110–119	3	0	0	0	3
100–109	14	4	4	3	25
90–99	57	12	16	10	95
80–89	91	27	19	7	144
70–79	73	21	13	5	112
60–69	57	6	9	7	79
50–59	27	4	1	1	33
40–49	7	1	2	2	12
30–39	2	0	1	1	4
Total	331	75	65	36	507

*Assam, Arunachal Pradesh, Sikkim, Manipur, Meghalaya

TABLE 2

SIGNIFICANCE OF DIFFERENCE BETWEEN JOB SATISFACTION SCORES OF TEACHERS

Sl. No.	*States*	*Number*	*Mean*	*S D*
1	Orissa	331	78.10	14.66
2	Bengal	75	80.63	12 32
3.	Bihar	65	80 96	14 19
4	Other States*	36	79 23	17.53
5.	Combined other States**	176	80.41	14 35

Difference between the scores of teachers of	*SE of Difference between means*	*Critical Ratio*
Orissa and Bengal	1 63	1.55 n s.
Orissa and Bihar	2.18	1.31 n s
Orissa and other States	3 03	0 37 n s.
Orissa and other combined States	2 88	0.78 n s

* Assam, Arunachal Pradesh, Sikkim, Manipur, Meghalaya

**Including Bengal and Bihar

TABLE 3

TEACHERS FOUND SATISFIED AND DISSATISFIED

States	*Satisfied*	*Dissatisfied*	*Total*
Orissa	165 (49.85)*	166 (50.15)	331
Bengal	43 (57.34)	32 (42.66)	75
Bihar	39 (60.00)	26 (40.00)	65
Other States	20 (55.55)	16 (44.45)	36
Total	267 (52.66)	240 (47.34)	507

* Figures in brackets show percentage of numbers

TABLE 4

JOB SATISFACTION SCORES OF TEACHERS OF VARIOUS SUBJECTS

Scores	*Eng*	*Phy. Sc*	*Eco. Geo.*	*Hist. Civics*	*Math.*	*Hindi*	*Total*
110–119	0	0	2	0	1	0	3
100–109	4	6	5	6	3	1	25
90–99	12	27	11	19	18	8	95
80–89	18	34	20	39	25	8	144
70–79	7	28	11	22	39	5	112
60–69	10	22	13	14	17	3	79
50–59	4	9	5	4	11	0	33
40–49	0	6	2	2	2	0	12
30–39	0	1	1	0	2	0	4
Total	55	135	70	106	118	25	507

From Table 4, we find that maximum value of 80.85 for mean is obtained by teachers of history/civics whereas the teachers teaching mathematics score the least mean of 74.50 amongst all the teachers of various subjects. The difference in the means of these two groups of teachers is significant and no other comparison has revealed any significant difference between their means.

A further discussion seems to be quite relevant to look into the number of teachers found satisfied and dissatisfied in respect of their teaching subjects. This is necessitated because of the fact that the total spread-over of the scores with SDs of 12 to 16 may not be discriminating between satisfied and dissatisfied teachers Moreover, we find that there is a difference between mean scores of teachers of different subjects which, however, is not found to be statistically significant.

Obviously, it is observed in Table 6, that whereas 62.16 per cent teachers of history/civics were found to be satisfied, there were 61.86 per cent

TABLE 5

SIGNIFICANCE OF DIFFERENCE BETWEEN MEAN SCORES OF JOB SATISFACTION OF TEACHERS

Subjects	*Mean*	*N*	*S D.*	*Interpretation*
Physical Science	78.37	93	14.30	σD=2.63
Economics/Geography	77.36	57	16.41	CR=0.57
Physical Science	78.37	93	14.30	σD=2.08
History/Civics	80.85	74	12.51	CR=1.19
Physical Science	78.37	93	14.30	σD=2.43
Mathematics	74.50	73	16.47	CR=1.59
Economics/Geography	77.36	57	16.41	σD=2.62
History/Civics	80.85	74	12.52	CR=1.33
Economics/Geography	77.36	57	16.41	σD=2.91
Mathematics	74.50	73	16.47	CR=0.98
History/Civics	80.05	74	12.51	σD=2.41
Mathematics	74.50	73	16.47	CR=2.62

TABLE 6

TEACHERS TEACHING DIFFERENT SUBJECTS FOUND SATISFIED AND DISSATISFIED

Subjects	*Satisfied*	*Dissatisfied*	*Total*
English	34 (61.81)	21 (38.19)	55
Physical Science	67 (50.37)	66 (49.56)	133
History/Civics	66 (62.26)	40 (37.74)	106
Mathematics	45 (38.14)	73 (61.86)	118
Hindi	17 (68.00)	8 (32.00)	25
Economics/Geography	38 (54.29)	32 (45.71)	70
Total	267	240	507

teachers of mathematics who revealed themselves to be dissatisfied. This very inference follows the findings on the significance of difference between mean scores of these teachers. Similarly, in the case of English language teachers, 61.81 per cent of them are noted to be satisfied, whereas in physical sciences only 50.37 per cent teachers were found to be satisfied. This may be right to interpret on the basis of this discussion that these two variables cannot be seen in isolation from each other.

Job Satisfaction v. Qualifications

Another variable which has been taken to be a work-role variable and studied in relation to job satisfaction is the variable of qualifications of teachers. Just like the analysis of other variable, chi-square test of independence has been applied on the contingency Table 7. The value of chi-square for 24 degrees of freedom has been calculated to be 25.03 which lies in between the probability values of .50 and .30. This suggests that job satisfaction scores and qualifications exhibit their independence existence bearing no relationship with each other. The analysis has, however, been further stretched in the interpretation of mean scores of the teachers having B.A., B.Sc., M.A., and M.Sc. degrees.

TABLE 7

JOB SATISFACTION SCORES AND QUALIFICATIONS OF TEACHERS

Scores	*B A.*	*B.Sc.*	*M.A.*	*M.Sc.*	*Total*
110—119	2	1	0	0	3
100—109	8	7	8	2	25
90—99	35	34	20	6	95
80—89	55	43	40	6	144
70—79	27	51	24	10	112
60—69	36	30	10	3	79
50—59	12	16	3	2	33
40—49	5	4	2	1	12
30—39	2	1	1	0	4
Total	182	187	108	30	507

It may be observed from Table 8 that no significant difference between mean scores of B.A. v. B.Sc (CR=.62) and M.A. v. M.Sc. (CR=.88) teachers has been reported But a significant difference between the mean job satisfaction scores of graduate and postgraduate teachers with a CR= 2.27 has been recorded. It may be visualized that as if higher value of mean (81.17) goes with higher qualifications that is for postgraduation and lower value of mean (78 02) is associated with lower qualificatons, i.e. only graduation. This may give weight to the view that basis of job satisfaction in teaching profession may be seen in higher qualifications. Table 9 explains that being satisfied or dissatisfied at the job is dependent upon teachers' qualifications ($\chi^2=9.31$ for three degrees of freedom, significant at .01 level). We come to know that 45.45 and 46.66 per cent science graduates and postgraduates, respectively, are satisfied in science group, whereas in arts group this percentage goes to 54.94 and 62.96, respectively. We may conclude that more teachers in arts group are satisfied than in the science group And in arts group postgraduates decisively outnumber the graduate teachers in satisfaction.

The value of rβ is .13 between job satisfaction scores of graduate and postgraduate teachers is significant It refers to the close positive relationship between job satisfaction scores and their qualifications.

Age v. Job Satisfaction

A simultaneous study of age and job satisfaction scores has also been made and it is found that age and job satisfaction scores are independent of each other.

TABLE 8

SIGNIFICANCE OF DIFFERENCE BETWEEN MEAN SCORES OF JOB SATISFACTION OF TEACHERS OF DIFFERENT QUALIFICATIONS

Qualifications	*N*	*Mean*	*S D*
B A.	182	78.57	15.37
B.Sc	187	77.60	14 37
M A.	108	81 72	13.32
M.Sc	30	79.17	14.31
Graduates (B.A.+B Sc.)	369	78 02	14.93
Postgraduates (M A.+M.Sc)	138	81.17	13.59

Table 10 represents a true dichotomy of satisfied and dissatisfied teachers. The coefficient of correlation (point biserial) is calculated to be only 0.07, and is not significant. It is also shows that there is no significant difference between the mean ages of satisfied and dissatisfied teachers. We can say that there exists no direct relationship between job satisfaction and age.

However, Table 11 corroborates Herzberg's (1957) conclusion : "Workers begin with high morale, which drops during the first five years of service and remains low for a number of years. As service increases morale tends to go up". In the age-group 20-29, 55.07 per cent teachers are

TABLE 9

SATISFIED AND DISSATISFIED TEACHERS OF DIFFERENT QUALIFICATIONS

Qualifications	*Satisfied*	*Dissatisfied*	*Total*
B.A.	100 (54.94)	82 (45.06)	182
B.Sc	85 (45.45)	102 (54.55)	187
M.A.	68 (62.96)	40 (37.04)	108
M.Sc.	14 (46.66)	16 (53.33)	30
Total	267	240	507

TABLE 10

AGE AND JOB SATISFACTION SCORES

Age in years	*4—79* *Dessatisfied*	*80—120* *Satisfied*	*Total*
55—59	0	1	1
50—54	1	8	9
45—49	12	21	33
40—44	27	47	74
35—39	96	71	167
30—34	73	81	154
25—29	30	33	63
20—24	1	5	6
Total	240	267	507

found to be satisfied whereas in the age-group 50-59, this percentage rises to 90. However, for the age-group 30-39, percentage of satisfied teachers had dropped to 47.35 and this value is seen inflated to 63.55 for the age-group 40-49. It may be concluded that there exists no linear relationship between age and job satisfaction.

TABLE 11

RISE AND FALL OF JOB SATISFACTION SCORES OF TEACHERS WITH AGE

Age in years	*Satisfied*	*Dissatisfied*	*Total*
50–59	9 (90 00)	1 (10 00)	10
40–49	68 (63.55)	39 (36.45)	107
30–39	152 (47 35)	169 (52 64)	321
20–29	38 (55 07)	31 (44 93)	69
Total	267	240	507

Job Satisfaction v. Teachers' Training

It has already been pointed out that this study also involves a sample of 492 working teachers undergoing B.Ed. training under summer school-cum-correspondence course. A comparative analysis of the job satisfaction of trained and teacher-trainees is reported in Table 12.

In the case of trained working teachers, it has been reported in the analysis of Table 1 that mean job satisfaction score comes to be 78.92 and as a whole 52 66 per cent (Table 3) teachers are found to be satisfied. However, a significantly greater percentage (64.63 per cent) trainee working teachers have been found to be satisfied. In the comparison of mean scores (Table 12), the mean score of trainee-teachers (82.61) is found to be significantly greater than trained working teachers It may be taken that while undergoing B.Ed. training, trainees' morale is boosted up which is reflected in their higher satisfaction scores. It is a welcome finding that atleast training period enhances the spirit of teachers which need to be further strengthened and sustained. The author in his study (1972) and Koul (1977) had found that training brings no substantial change in the job satisfaction and positive attitude of student-teachers for their profession. In the light of this discussion, the question needs further investigation.

TABLE 12

SIGNIFICANCE OF DIFFERENCE BETWEEN JOB SATISFACTION SCORES OF TRAINED AND TRAINEE WORKING TEACHERS

Teachers	*N*	*Means*	*S.D.*	*Interpretation*
FULL SAMPLE				
Trained	507	78.92	14.60	
Trainees	492	82 61	15 85	$\sigma D = 9648$ CR=3.82
ORISSA TEACHERS				
Trained	331	78.10	14.66	
Trainees	285	83.69	11.07	$\sigma D = 1.0387$ CR=5.38
BIHAR TEACHERS				
Trained	65	80.96	14.19	
Trainees	90	83.73	13.27	$\sigma D = 2.2481$ CR=1.23
BENGAL TEACHERS				
Trained	75	80.63	12.32	
Trainees	39	86.81	11.20	$\sigma D = 2.2891$ CR=2.70

It may give rise to the idea whether B.Ed. training should be allowed only to working postgraduate teachers and/or we should bring about some tangible changes in the teacher-education programme which should reflect in the increased positive attitude of student-teachers with the completion of their training period. It may also suggest that in regular B.Ed. Classes, 50 per cent seats should be reserved for working untrained teachers along with fresh postgraduates.

Summary of Findings

1. Fifty per cent teachers working in schools are reported to be dissatisfied.
2. States in which the teachers are working bear no correspondence with their job satisfaction.
3. The maximum mean score of job satisfaction is found to be of the teachers of history/civics and the minimum mean scores is calculated to be for the mathematics teachers. 62.26 per cent history/civics teachers are found to be satisfied, and 61.68 per cent teachers of mathematics are dissatisfied.
4. A greater percentage of postgraduate teachers, both in arts and

science groups, is found to be satisfied than the percentage of graduate teachers reported satisfied.

5 It is found that there exists no linear relationship between age of teachers and their scores of job satisfaction.

6. The percentage of satisfied trainee working teachers is greater than that of satisfied trained working teachers.

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Talents and Their Training

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INDIA had been under alien rule for about a couple of centuries. During the period of British sovereignty the Europeans enjoyed full powers of administration and Indians were not allowed to hold top positions. The jobs that required the slightest amount of intelligence, foresight, orginal thinking, planning, etc. were not given to them. But with the transfer of power to India all the important offices of administration, planning departments, commercial enterprises, etc. came under Indian control. After the departure of the English rulers, a void was created in every field and it was filled in by Indians formerly working as subordinates. India proved to the world that it had the talent required for different types of jobs. It had been lying dormant but blossomed as soon as it got a favourable climate. Our duty is to search out this talent and to provide all possible facilities and training to develop it.

Research in the Field

Much work has been done in this field in many countries and several training programmes have been tried successfully. The names of Terman, Oden, Hollingworth, Witty, Gossard, Goswan and others are specially associated with this work. But we in India have not paid the matter the attention it deserves. The few facilities that are being provided are too meagre to meet the demands of this vast subcontinent. The need for suitable and large-scale steps in the matter is long overdue and should not be postponed any longer.

It is well known that intelligence is inherited. All human beings and some highly evolved species of animals are born with some degree of intelligence. Some have a high degree of intelligence, some average and others have very low degree. Intelligence of different individuals can be measured in terms of IQ with the help of intelligence tests (which have been developed and adopted for different countries (Lewis 1919) after the Binet-Simon scale. The gifted or the genius have a high score of IQ. This score is different according to different psychologists.

Identification

According to Terman (1919) those with 110-120 IQ are of superior intelligence, those with IQ of 120-140 are very superior, while those with IQ above 140 are near genius. Goddard regarded 120 IQ as the lower limit of the gifted. Hollingworth says that the gifted have an IQ of 180. According to Terman the gifted have an IQ of 135 and above Tyler forsakes the IQ criterion and defines the gifted child as one who is exceptional in the amount of his production, the rate of his production, the quality of production or a combination of these. The child who excels all others, or most of them, does it faster and with a higher quality performance, is gifted There are others who think that a gifted child has superior intelligence, and a higher order of special ability or special field of interest. But as a matter of fact according to Spearman's 'two-factor theory', a man with general intelligence of high order manifests high intelligence in special fields of interest as well. Such a child shows superior performance to one with lower general intelligence along with higher special intelligence.

Characteristics of a Gifted Child

(*a*) *Physical* : A gifted child is one or one-and-half lbs. heavier at birth than an average child and shows easier, quicker and healthier development. He has earlier maturity in different limbs and begins to sit and walk two or three months earlier Though a gifted child has early teething, a gifted girl has earlier teething than a gifted boy. He has a quick motor reaction. Twenty-five per cent gifted children suffer from weak eyesight.

(*b*) *Intellectual* : A gifted child is studious by nature and, a desire to know more and more is an obsession with him He has more liking for abstract and content subjects than for tool subjects. He is fond of mental manipulation. According to Kothari (1966) the highly gifted are too creative to be confined within the four walls of the classroom A genius may be poor in one or another subject, often a failure in examination or mediocre in performance. Rabindra Nath Tagore, the great poet, educationist and philosopher, failed to pass his ordinary examination. But such children can quickly make up for their deficiency in the subjects(s) in which they lag behind. They have dislike for routine and drill-work and prefer /challenging and original work. They have a desire to excel and stand above the average. They become lazy in the company of subnormal or even normal children. They have a wonderful insight and foresight. As their critical faculties are highly developed they indulge in self-criticism and cheerfully accepts their constructive criticism by others.

Witty (1951) on the basis of the findings of her study of 100 gifted children has enumerated the following intellectual characteristics of the gifted child :

1. Has a large vocabulary and uses it correctly.
2. Uses phrases and sentences at an early age and has an ability to tell and reproduce stories.
3. Has an interest in books and later enjoys study of Atlases, dictionaries and encyclopedias.
4. Is interested in calenders.
5. His ability to read develops earlier than that of an average child.
6. Has a capacity to concentrate longer than most children.
7. Has an early discovery of cause-and-effect relationship.

In other words, gifted children have all the primary mental abilities highly developed, e.g. numerical abilitiy, verbal fluency, verbal comprehension, memory, spatial relation and inductive as well as deductive reasoning. They have constructive thinking, are adaptable and have knowledge as well as capacity to use it. They have a great mental energy, good sense of humour, sustained attention and mature power of use of language.

(*c*) *Emotional and Social* : Gifted children generally come of families of higher social and economic status and such have not much understandings of others. But they are social by nature. They enjoy the company of their peers but also freely mix with average students. They are cooperative, earn goodwill of others, become very popular and are often obeyed as leaders or worshipped as heroes. Their basic need is love and they need acceptance and appreciation by others. They are sometimes problem to their parents who do not understand them. They are also misunderstood outside. Though sometimes some gifted children are high strung, they are generally humorous and cheerful. They have a good character and have great moral sense. They are self-confident and optimistic. Witty (1951) found 45 per cent children fond of games, 58 per cent fond of making friends, 96 per cent well disciplined and 88 per cent of them were eminent statesmen. All of them had one or another hobby and were fond of extra-curricular activities.

Impact of Environment

Though genius is hereditary, environment plays an important role in the development of genius. Frances Galton, a cousin of Charles Darwin, published the first systematic study of genius in 1869. He held that genius is hereditary and gifted chidren are born of parents about the age of 37. They are more males than females. They come from socially and culturally superior homes which provide abundant facilities for full flowering of their superior ability, rich family background and larger general information. But the genius are found even in less educated or even uneducated families. There is a famous saying in the West: 'What has been preordained by protozoa cannot be changed even by an Act of Parliament'.

Where to Search for Talent ?

Genius cannot develop to its full in vacuum. Very little of available talent is now discovered and developed because the home environment is often deprivative due to illiterate parents and often poverty. A good deal of talent never enters the school. Those entering and rising to secondary level do not flower fully as they are discovered when it is too late. They may sometimes not get good marks and may branded mediocres or deviates. An early discovery of genius is a must. But in our country homes do not provide an atmosphere conducive to their development. Education at home is incidental and informal. Such an education is good if it is administered in response to the needs of the child. But there should be more opportunities for self-activity, self-creativity and self-expression Manipulation of concrete material should be encouraged and hobbies, e.g. writing, collection, music, drawing and painting, playing of instruments, invention of toys, will ultimately lead to invention in the field of science, technology, commerce, etc. There should be visits to museums, libraries, historical places and so on. It is among such activities that they display their bent of mind and can be easily detected. Instead of showing off their gifted chidren parents should provide them with facilities, special attention, and opportunities for better social adjustment.

Lack of Facilities

In average schools the talented children do not get the above-mentioned facilities. There is no individual attention as classes are over-crowded. They get no opportunity for self-study and class routine leaves no time for extra-curricular activities, where we can discover their aptitudes and field of special interest.

In order that such facilities may be available to the telent, it is preferable to make arrangement for some special types of schools where such talent may blossom to its full. But such a special treatment to them is resented by many people. They say that such schools will create another class of intellectual aristrocrats, which will go against the cannons of democracy. These people forget that democracy provides that each individual should get an opportunity to proceed at his own pace, not that those below should act as a dead weight in their forward march. These are the days of the survival of the fittest and in these days of advanced technology there is struggle for existence. We do not agree with the view of Huxley when he says, "survival of the fittest really implies fitting the greatest number of people to survive". Talents are assets of the nation and will pay rich dividends if properly invested. We cannot do better than quote Prof. Mujib who says :

> Democracy cannot thrive upon suppression of talent. On the contrary its health depends upon gifted individuals who utilize their aptitude to promote common interest in various fields and activities. The good school must, therefore, do what it can, to identify gifted pupils and to provide them challenges and opportunities which stimulate their mental development.

Kothari (1966) has also expressed similar views :

> Dearth of competent and trained manpower is felt in every field of national life, it is one of the bottleneck to progress. Poverty of finance is great but poverty of trained intellect is greater still. Therefore, we should cast a net in five years' primary education to identify talents, lead them to the secondary stage and the university which will develop them to their full bloom.

Hollingworth in his book *Talents and Defects* says :

> Civilisation has become complex through the discoveries and inventions of superior deviates, e.g. wheel and lever. . ., courts and statute books, use of gravity, steam electricity. Would it be better to end inventions at source by eliminating superior deviates. Men would miss these gifts, wholly benign for all, which only they can bestow. By neglect we would be forcing them into the general pattern of mediocres.

M.R. Sumption and others in *Special Education of the Gifted Child* says that "society is injudicious in the extreme to neglect those children who possess the potentialities of high-quality leadership . . . Our stucture both national and international demands leadership of the highest quality, and keenest intelligence. Where else may we look for this type of leadership except among those of intellectual superiority".

Thus we see that a great majority of educationists favour establishment of schools where the talents may not only be discovered during the course of extra-curricular activities, but may also be developed to their full in a congenial atmosphere in directions suited to their aptitudes. The better the arrangements made and opportunities provided, the better will be the result. Investment on these institutions will not be a waste but the nation will reap a very rich harvest of flowering genius.

Special Schools on the Pattern of English Public Schools

Special schools for the talents of the country had been advocated both by Indian and British educationists In the early forties, Principal F.F. Monk in his article 'Educational policy of India : A neglected aspect' expressed his opinion that chief's colleges (established on the recommendation of the Hunter Commission, 1882) should be converted into Indian Public Schools, not for the pupils belonging to the hereditary class, but open to all who can profit from them They were outstanding in many ways, with good buildings, equipment and highly qualified and competent staff. He would wish them to multiply to provide a chance to all who merited admission to them. He was against curtailing their expenditure, as that would mean fall of standard, nor did he relish the idea of increasing the number of students as that would deprive the students of individual attention and human touch which is more necessary in education than in any other field. So he recommended scholarships and stipends to students who were admitted to them after suitable standard test, only to the lowest class. Poverty would be no bar nor richness a passport to such schools He considered this a truely democratic method of selection by which quality would not be sacrificed to quantity as is commonly found in schools after injudicious and hurried expansion of education in India. There was freedom from departmental routine which is a bane of Indian educational policy. Provision for such schools was also advocated by F.G. Pearce, Principal, Scindhia School, Gwalior.

Some people regard these schools as anachronism in modern democracy. They have made no material contribution to the cause of education but have only produced narrow-minded snobs, unfit for democracy, perpetuating class feeling. But Sargent (1944) says :

> Its products display a capacity to set up and abide by standards of conduct and readiness to accept responsibility, qualities which must form an essential equipment of a public servant.

Even the Secondary Education Commission (1952-53) reports that :

> They have a place in the education system of the country as they develop correct attitude and behaviour and enable students to become useful citizens, with qualities of leadership. They should not breed foreign culture but must take their roots in the soil of the country, provide national education and develop sportsmanship and a sense of dignity of labour and social service.

This shows that with a little adjustment these schools can serve as a good training ground for the talents of the country. India cannot afford so expensive schools. So we can have separate schools with good staff, equipment, etc. where such students may get a good education among their peers. But such schools can be possible only where the number of gifted children is large enough to make them economic. Then this breeds a class feeling. Gifted children are over-worked and are deprived of the stimulus they get in company of ordinary students. Moreover, other students develop inferiority complex and even a feeling of jealousy. All this does not support the principle of segregation

To meet the great demand of suitable education for such children, some other practices have also been recommended.

Novel Practices to Promote Talents

1. *Acceleration* : This means to promote the top-most students to higher grades. This practice was also in vogue in India under the name of 'double promotions' in one year. On the basis of the result of the half-yearly examination good students were promoted from Class III to Class IV and then on the basis of the result of the annual examination from Class IV to Class V. This practice was repeated once more when they were similarly promoted from Class V to Class VI and then from Class VI to Class VII. Thus they saved two years. Promotions were limited to the above classes only. But this practice had to be dropped as it left serious gaps in the knowledge of fundamentals taught in different classes in the period in which the students skipped over to the higher class. Moreover, there was a difficulty in social adjustment because students after double promotion found themselves in a class of students two or more years, their senior in age. In America there is another addition of this system in which gifted students are allowed to do some of the college work during leisure hours in the high school. On the basis of this work they are allowed admission to a higher standard at the close of high school. Torman and Oden are associated with research work done in this sphere.

2. *Ability Grouping* . Hollingworth is the principal advocate of the system of grouping children according to their ability as measured with the help of intelligence tests, achievement tests, aptitude tests, teacher's judgement, teacher's marks and cumulative records.. Gifted children are placed in a special group for a part or the whole of the day. They stimulate one another and pool their various experiences for common good. It also includes placing gifted students from different schools in a single special group or a special school. Sometimes there are special schools for students with certain common interests and abilities. Such schools are possible only in large metropolitan towns. Where the number of gifted students in a school is not large enough for special groups within the school, centrally located schools are chosen for ability grouping There is also ability grouping for a part of school time in some subjects, say, mathematics, chemistry, art, music, dramatics, etc. Gossard, Goswan, Lorge, Hollingworth, Terman, Wolfson and several others have conducted studies on the effect of such programmes and have testified to their efficacy

3. *Enrichment* : Enrichment consists in giving the child an opportunity to go deeper or to range more widely than an average child in his intellectual, social and artistic experience. But it must be accompanied by acceleration or ability grouping otherwise the gifted child continues to remain with others of his age-group but of various levels of ability. Enrichment does not consist in giving more contents and activity of the same type of work, because such children do not like drill-work It may include some creative experience, investigational work, independent and original work, cooperative work which provides an opportunity for leadership, first-hand experience, extensive reading or some community responsibility. Some enrichment programmes consist of assignments, projects, (as is done in Science Talent Search Tests in India), units of study of sufficient scope and complexity not explored by average students, which allow the most gifted pupils to use and develop their talents. Such programmes are advocated by Gossard and Wolfson on the basis of the results of their researches conducted to study the effect of such programmes.

Kothari (1966) has also suggested a slightly different form of enrichment programme It consits of extra-mural programmes, e.g. :

1. Five/six, weeks' summer programme of several schools together, with facilities of staff, library, laboratory, equipments, etc.
2. Visits to laboratories, museums, historical places, etc.
3. Contact with specialist people in the field of talented children.
4. Hostel and day-hostel accommodation for those with defective home atmosphere.

These extra-mural enrichment programmes develop intellectual, emotional, social and special abilities of all such children under special guidance. Such a combination of superior talent and superior training was a matter of chance, in the past. But we cannot now afford to leave this to sheer stroke of chance. Superior ability and superior training must be deliberately brought together. There is a popular craze to bring down standard to suit mediocres and to relegate the gifted. Play-way and basic education are only means to the end—to create great artists, poets, scholars, philosophers, saints, scientists, statesmen, industrialists.

Conclusion

The author has personal knowledge that ability grouping was tried by one of his acquaintances. He selected about a dozen top-most students, preparing for the Intermediate examination of U.P. Board. He gave them extra coaching in a number of main subjects. As a result of this ability grouping for these subjects all the students showed good results. One of them distinguished himself in English and maths, eight in maths, one in Sanskrit. One of them secured first division in the examination and secured ninth position in U.P. They would have shown much better results had they been given similar opportunity from the primary stage. This was creditable specially in the rural surroundings in which the college was situated. He used this system with similar success, for several years. Students who joined the ability group fared equally well in higher education also.

Ability grouping can be arranged by good teachers, who have good academic background in more than one subject and are interested in the development of their students. Besides, this approach needs no extra expenditure on equipment, etc. So we in India can give it a fair trial.

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LI

Prediction of Success in Bachelor's Degree Examinations in Arts, Science and Commerce

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THE PRESSURE on colleges and universities of admission-seekers has outstripped the expansion of facilities, consequently highlighting the competition for admission specially in better colleges and universities. This rush of student population is likely to increase further because of the current sociological and educational changes taking place in our country. Firstly, university education has become a coveted objective as if success in passing through it holds the key to access a comparatively prized life as well as to social preferment. Secondly, our government is launching a programme of universalization of education and a programme of comprehensive schooling of ten years for all. Therefore, the number of eligible students for admission to university education will increase tremendously in the coming years. Even if only 30 to 40 per cent students graduating from high school will be seeking admission to colleges and universities, this percentage would be much larger under universalization of education scheme then the number of persons seeking admission today. Thirdly, due to the phenomenon of social mobility, as everyone aspires to acquire socially and economically higher position in the society. As never before, the farmers, artisans, labourers, industrial workers have all begun to appreciate the value of higher education.

Necessity of Selection Programmes

When the number of students seeking admission in colleges, is larger than the seats available the selection of right students becomes a matter of concern to the educational authorities. It is their responsibility to be as certain as possible that the students they select will do better than those rejected for admission. At the same time it is noticed that this is not an easy task by any means Notwithstanding the selection tests for admission to colleges and in most cases even after careful selection of the most worthwhile students, it has been repeatedly observed that an appreciable percentage of those selected fail to perform in examinations in accordance with the standards A few fail to achieve even moderate results. Some others even fail and repeat the same course. Not only this, a good number of even those who are provided with financial support and given an enriched programme of education under various 'talent identification and development' schemes do not perform according to the expectation and, therefore, national resources are wasted, and others who might do better are deprived of such national support. This is not a mere guess but it actually happens so. In the National Science Talent Search Scheme conducted by the NCERT over the last twelve years, follow-up studies showed that of the awardees admitted in B. Sc first year, only 34 per cent reached the M. Sc. final class, and only 15 per cent registered themselves for Ph.D. and only 8 per cent completed Ph D. in normal time. The opposite of this also happens when the selection criteria are not highly reliable and valid. It was also found that a significant proportion of non-awardees did better than awardees in university examinations Therefore, the concern with the prediction of academic performance has increased during recent years.

Prediction of Academic Performance

(The prediction of academic performance is beset with large number of problems. The first concerns the standardization of predictor measures, the second concerns the independence of predictor measures, and the third concerns that nature and kind of predictors such as the intellective or the non-intellective.

A brief review of the results of some of the relevant studies on prediction of academic achievement showed that three kinds of predictors were generally used in these studies · (*a*) intellective factors, (*b*) personality factors, and (c) non-intellective/non-personality factors. Further, the review showed that (i) while mental ability or intelligence is an important factor in an academic situation, it is not the only factor, (ii) the correlation between ability as assessed by verbal tests and scholastic achievement may have arisen from the factor of verbal skill or better semantic material common to both situations, (iii) if there was any relation between general ability and achievement, it should also be found when tests using other contents (figural, symbolic and behavioural) are substituted for verbal tests of ability, (iv) an investigation employing different content tests on structure of intellect model appears to be warranted, and (v) non-intellective personality factors seem to play a significant role in academic achievement.

For the present investigation it was decided to use both kinds of predictors—intellective as well as non-intellective and personality. The intellective factors were selected from Structure of Intellect (SI) factors and the non-intellective and personality factors included were: adjustment to academic environment, personality needs measured by the Edwards Personal Preference Schedule, and the introversion/extroversion traits measured by Neyman-Kholstedt Scale.)

The choice of the SI model was guided by two important criteria of judging predictors: (i) independence of predictive measures, (ii) the correctness of purpose that a predictor purports to measure. The SI factors being independent of each other, by and large, their use in multiple regression analysis would offer the greatest promise for a better solution as the adding test of entirely new factors to the existing predictors of achievement increases the multiple correlation in the most desirable manner. Secondly, the SI model had distinguished a large level of category for dealing with the different types of contents—figural, symbolic, semantic and behavioural and they are not limited to verbal and non-verbal ability recognized or employed in prediction problems. Thirdly, it appears to have potentialities to measure many intellective abilities that are involved in successful mastery of any school subject or a group of subjects, which may be classed under science, arts and commerce streams. However, not all the 120 factors of the SI model were used. We used those factors which appear psychologically more meaningful in terms of the criterion of achievement and we remained oriented in logically meaningful way. Thus 15 factors were used for science measured by 33 tests, 13 factors were used for arts and commerce each measured by 28 tests.

The measures of non-intellective factors were used to explain academic performance rather than to serve as effective predictors; and to cover as many variables as possible in an economic manner, the multivariate tools appeared more desirable. In the case of multivariate tools, the relationship between the different variables included is known; the variables are usually independent of each other and a fewer number of such tools is sufficient. The Edwards Personal Preference Schedule measures 15 personality variables; Narayana Rao's Indirect Adjustment Inventory covers six areas of adjustment on college environment—(*i*) adjustment to curriculum, (*ii*) maturity of goals and level of aspirations, (*iii*) personal efficiency, (*iv*) study habits and practices, (*v*) mental health, and (*vi*) relations with peer teachers; and Neyman-Kohlstedt Introversion/Extroversion Scale measures this trait. Employing the above intellective and non-intellective personality predictors, achievement at the graduate level as perdicted by means of regression equations worked out for each of the three streams—science, arts and commerce.

Purpose of the Study

The specific objectives of the present investigation were :

1. To determine the structure of intellect predictors of success in B.Sc., B.A. and B.Com. university examinations.
2. To determine the non-intellective predictors of success in B.Sc., B.A. and B.Com. examinations
3. To establish prediction equations for success in B.Sc., B.A. and B.Com. examinations.

Sample

Subjects for investigation belonged to three postgraduate colleges of Meerut University situated in the town of Dehra Dun. One was a men's college, another a women's college and the third was a co-educational one. The three colleges could be regarded as representative of Meerut University student population. The subjects of the investigation were students of three streams—science (46), arts (44) and commerce (49). They represented all levels of ability as determined by their intermediate examination results.

Data Collection and Analysis

The subjects were administered 33 tests for measuring 15 structure of Intellect (SI) factors, and three non-intellective inventories and records covering 22 personality and non-intellective areas. The testing was done by the investigator himself under normal classroom conditions in groups ranging from 20 to 25. The answers were scored by using the appropriate keys and instructions supplied with the tests. The data was analysed on electronic computers to achieve the objectives of the study and to examine the hypotheses. The following statistical treatments were employed :

1. Intercorrelations of intellective and non-intellective variables, as also their correlations with the criterion of academic success, namely, the total marks obtained in the final B.Sc./B.A /B.Com. university examinations.
2. Step-wise regression analysis to determine the best predictor of success in science, arts and commerce streams. Seven regression equations for each stream were worked out. An application of these was made to determine those which discriminated between first, second and third divisioners.
3. Means and standard deviations for first and third divisioners were computed and a test of significance of these groups was made by working out critical ratio for all efficient predictors of a stream.
4. A correlational analysis of EPPS variables was made.
5. The predictor profiles of the three streams were graphically presented for comparison.

Findings

Intellective Predictors

Science stream : The criterion of success was the aggregate of marks in B.Sc. final examination of Meerut University held in 1975. The step-wise regression analysis was carried out to determine the best predictors These came out to be F_a (Associational Fluency), S_s (Spatial Scanning), IAAI (Indirect Academic Adjustment Inventory), F_W (Word Fluency), S_{ep} (Sensitivity to Problems) O (Originality) and F_i (Ideational Fluency). The multiple R with the single predictor F_a was .475 and it became .601 by adding the other six predictors. Both these values are significant at 1 per cent level and of satisfactory magnitude. The seven factors explain 37 per cent of the variance.

Of the seven predictors, six were intellective and one non-intellective (IAAI). The six intellective factors in terms of Guilford's terminology were as under ·

F_a	S_s	F_W	S_{ep}	O	F_i
DMR	CFI	DSU	EMI	DMT	DMU

It is thus seen that of the six predictors, four required the operation of divergent production (D) which is concerned with generation of logical alternatives from given information where the emphasis is upon variety, quantity and relevance of output from the same source. This ability (divergent production) is obviously most important for scientific work particularly at the professional and technical level Of these four (D) operation factors, three utilize the content (M), which pertains to information in the form of conception or mental constructs to which the words are often applied. It is the most notable quality in verbal thinking and verbal communication. The university students, in order to be successful in the examination as also to profit from higher education should naturally possess and develop facility in verbal thinking and verbal communication. Therefore, factors utilizing divergent production operation (D) and semantic (M) content are no wonder the best predictors of success in science and scientific pursuits

An important finding was the absence of factors requiring the operation of memory and convergent production These operations concern with fixation of newly gained information in storage and on achieving conventionally best outcomes but present-day scientific pursuits demand divergent production more than conventional thinking

The seven prediction equations were set. Any one of them could be used to predict success in B.Sc. examination according to time and resources available. These equations were applied to see how far they successfully discriminated between first and third divisioners. The first three equations, with single predictor (F_a); two predictors (F_a and S_s); and three predictors (F_a, S_s and IAAI) appeared to efficiently discriminate between first and third divisioners. However, the three predictor equations with F_a, S_s and IAAI appeared to be more desirable as it discriminated all the three groups—first, second and third divisioners—quite satisfactorily

Arts stream : The criterion of success was the aggregate of marks in B.A. final examination of Meerut University held in 1975. The step-wise regression analysis brought out the following seven best predictors of success in arts : (*i*) F_e (Expressional Fluency), (*ii*) IAAI (Indirect Academic Adjustment Inventory), (*iii*) X_s (Sematic Spontaneous Flexibility), (*iv*) X_a (Figural Adaptive Flexibility), (*v*) I (Induction), (*vi*) F_i (Ideational Fluency), (*vii*) S_s (Spatial Scanning). The multiple R with a single predictor F_e was .765 which is indeed a very high one and explains 59 per cent of the variance, the multiple R become .853 by adding the other six predictors and thus 73 per cent variance could be explained by the seven best predictors

Of the seven predictors, six are intellective and one is non-intellective (IAAI) Curiously enough, this non-intellective factor appears in both arts and science streams. The six intellective factors in terms of Guilford's terminology were as under :

F_e	X_s	X_a	I	F_i	S_s
DMS	DMC	DFT	CFC	DMU	CFI

From the above it is seen that of the six predictors, three utilize the content (M) semantic, that means success in arts depends upon concepts and mental constructs to which the words are often applied, hence most notable in verbal thinking and verbal communication. In the other three factors, figural (F) content is involved which pertains to information in concrete form as perceived or as recalled in the form of images, letters and words which are also figures in one sense. Secondly, four factors utilize the operation of divergent production (D). It means that success in arts depends upon variety, quantity and relevance of output from the same source. The operations in the other two factors are of cognition (C), that is, comprehension and understanding. An appreciation of any poetry, or writing criticism of any author, or writing a good essay on any topic, these are the tasks with which arts students are usually concerned and all these naturally demand the operations of cognition and divergent production more than any other operations. Similar to the findings of science stream, there is the absence of the factors requiring the operation of memory and convergent production. It appears that emphasis is being laid more on generation of logical alternatives from given information rather than on achieving conventionally best outcomes even in the arts stream. It is perhaps due to the influence of scientific age on teaching of any subject which is evident from the fact that the word social science is more prevalent in these days and the word 'science' is used with titles of subjects like science of psychology, science of economics, political science instead of calling them psychology, economics or politics.

The seven prediction equations were set An application of prediction equations using the predictors mentioned above showed that all the seven equations except the fourth one were efficient for sorting out the achievers from non-achievers. The best prediction was, however, provided by equation using three predictors—F_e, IAAI and X_s.

Commerce stream : The criterion of success was the aggregate marks in B.Com. final examination of Meerut University held in 1975. The step-wise regression analysis showed that the seven best predictors were : (*i*) X_a (Figural Adaptive Flexibility), (*ii*) F_e (Expressional Fluency), (*iii*) S_s (Spatial Scanning), (*iv*) IAAI (Indirect Academic Adjustment Inventory), (*v*) N (Number Facility), (*vi*) F_i (Ideational Fluency), (*vii*) S_{ep} (Sensitivity to Problems). The multiple R for the single best predictor X_a was .554 and it was raised to .771 by adding the other six predictors. Both these values are significant at 1 per cent level and they are of satisfactory magnitude. The seven factors explain 59 per cent of the variance.

Like the predictors of science and arts streams, six are intellective and one is non-intellective (IAAI). This non-intellective factor has been found to be a predictor of success for science and arts courses as well. The six intellective factors in terms of Guilford's terminology were as under :

X_a	F_e	S_s	N	F_i	S_{ep}
DFT	DMS	CFI	NSI	DMU	EMI

Thus, it is seen that three predictors make use of the operation of divergent production (D). It appears that success in university examination in commerce demands source. In the science and arts streams also we had seen the preponderance of the 'D' operation But in science and arts streams, the convergent production operation (N) did not make its apprearance, while it is present in one of the commerce predictors 'N' involves generation of logical conclusion from given information, usually achieving the conventionally best outcome; it is likely that the given information fully determines the outcome. The commerce student in his student career as well as in his business life cannot afford to draw conclusions beyond given facts and factors. At times his competence lies in cutting the 't' and dotting the 'i'. The content of three factors is semantic (M) and figural (F) for two factors. The semantic and figural contents appear to be important for commerce courses because verbal expression, oral and written, is important for success in subjects included in commerce stream and some of which are common to arts such as language, economics, geography. Symbols are also important in commerce courses particularly in accountancy and filing work.

The seven prediction equations were worked out. An application of the prediction equations using the predictors above showed that the three predictor equations provided the best discrimination between the achievers and non-achievers in commerce.

Non-Intellective Variables

Three non-intellective variables were used in this investigation, two of which were multivariate, Edwards Personal Preference Schedule (EPPS) and Indirect Academic Adjustment Inventory (IAAI), and the third measured the introversion-extroversion (I-E) trait. EPPS measured 15 independent personality needs and it did not provide a single score. Therefore, an analysis of these 15 personality variables along with two other non-intellective variables (IAAI and I-E) and 13 intellective factor could not be accommodated by the computer available to the investigator. The analysis of LPPS variables was done separately. The findings were as under :

Science stream Four personality needs N-End, N-Def, N-Aff and N-Ord were related to success in science stream The personality characteristics of endurance (hard work and to keep at a job until it is finished), orderliness (planning and organization of work and to keep things neat and orderly) are known to be possessed by scientists but they too possess the characteristic of loyalty to friends and receptiveness to others' suggestions.

Arts stream : Two personality needs were found associated with success in arts stream : N-Ach and N-Agg. Arts students as part of their courses of study learn to write criticism of authors and poets, to evaluate critically historical events, political issues, economic policies, etc. The personality characteristic of 'aggression' (to attack contrary point of view) are quite natural to be found in them but they also seem to possess 'achievement' (to be a recognized author) characteristic.

Commerce stream : Four personality needs were found associated with success in commerce : N-Int, N-Suc, N-Het, N-Dom. The commerce students are prepared to be practical and the possession of the personality characteristics of 'intraception (to understand how others feel about problems); 'succourance' (to seek affection from others), 'dominance' (to persuade and influence others) and 'hetrosexuality' (to engage in social activities with opposite sex) are understandable for success in business and commerce.

We have already seen above that the 'adjustment' to academic environment is a non-intellective requirement for success in all three streams, and introversion-extroversion trait is not related to success in any of the streams.

Concluson : There is no overlap in the personality needs of three groups of students and this uniqueness of personality of arts, science and commerce students should prove a great asset in sorting out students for the three streams.

Predictor Profiles

Seven predictors for each stream were identified. Three factors were common for all three streams—F_t, S_s, IAAI. Besides that two factors were common in arts and commerce : F_e and X_a, one factor was common in science and commerce : S_{ep}, and there was no common factor in arts and science. The factors which appeared exclusively for a stream were F_a, F_w

and O for science stream, X_s and I for arts stream and N for commerce stream.

Thus there were three common factors which were required for success at the graduate level whether a student pursued science, commerce or arts stream. This supports the commonly held view that some basic abilities are required for success at the university level. At the present time one non-intellective factor of overall adjustment of the individual to the college environment cannot be questioned. The intellective factor, Ideational Fluency (F_i), which measures the facility to call up ideas is naturally important for success in all courses where the answer to all questions requires organizing different ideas in a comprehensive and cohesive manner. Likewise, the ability, Spatial Scanning 'S_s' which measures speed in visually exploring a wide or complicated field and which also measures planning ability is important in comprehending the given material and re-arranging it in one's own way.

With four factors predictive of success in science and four different factors predictive of success in arts, it should not be difficult to sort out the students for arts and science streams. Those who excel in F_i, I, X, X_a could be placed in the art stream and those with high potentiality in F_a, F_w, and S_{ep} could be allocated to science. Students with high potentiality N, S_{ep}, F_c and X_a could be placed in commerce stream. Further, with some factors being exclusively predictive of success for one stream, it should not be difficult to sort out students for the three different streams.

An important finding is that the predictor profiles of the three streams are distinct and unique. Even when some factors are common between two streams, their strengths or weights are different.

Another important finding is that the seven best predictors of each stream are able to explain a good satisfactory proportion of the criterion variance The arts predictors account for 73 per cent of the criterion variance, the commerce predictors account for 59 per cent of the criterion variance, and the science predictors explain 37 per cent of the criterion variance. The prediction of high proportion of criterion variance in arts, and substantial proportion of criterion variance in commerce gives confidence that the work of sorting out students for these streams can be done through intellective factors only to a satisfactory degree. For science stream the nonintellective factors should be taken into account in addition to the intellective factors.

Conclusion

1. The intellective predictors for the different streams were as under :

(a) *Science stream* : The six factors in order of their importance were : (*i*) Associational Fluency (F_a), (*ii*) Spatial Scanning (S_s), (*iii*) Word Fluency (F_w), (*iv*) Sensitivity to Problems (S_{ep}), (*v*) Orginality (O), and (*vi*) Ideational Fluency (F_i).

(*b*) *Arts stream* : The six factors in order of their importance were : (*i*) Expressional Fluency (F_e), (*ii*) Semantic Spontaneous Flexibility (X_s), (*iii*) Figural Adaptive Flexibility (X_a), (*iv*) Induction (I), Ideational Fluency (F_i), and (*vi*) Spatial Scanning (S_s).

(*c*) *Commerce stream* : The six factors in order of their importance were : (*i*) Figural Adaptive Flexibility (X_a), (*ii*) Expressional Fluency (F_e), (*iii*) Spatial Scanning (S_s), (*iv*) Number Facility (N), (*v*) Ideational Fluency (F_i) and Sensitivity to Problems (S_{ep}).

2. Two intellective factors were common for all the three streams : Ideational Fluency (F_i) and Spatial Scanning (S_s).

3. There were factors which were required exclusively for a particular stream :

(*a*) *Science Stream* : (*i*) Word Fluency (F_w).
(*ii*) Originality (O), and (*iii*) Associational Fluency (F_a).
(*b*) *Arts steam* : (*i*) Semantic Spontaneous Flexibility (X_s) and (*ii*) Induction (I).
(*c*) *Commerce Stream* : Number Facility (N).

4 Three intellective predictor profiles for the three streams were distinct and unique, therefore, the job of placing students in different streams could be done scientifically, economically and easily on the basis of intellective factors (aptitude) alone.

5. The non-intellective factor, 'adjustment to academic environment' measured by Indirect Academic Adjustment Inventory (IAAI) was found to be a common predictor for all the streams.

6. The non-intellective personality needs measured by Edward Personal Preference Schedule were different for each stream, they were as under :

(*a*) *Science stream* : (*i*) N-endurance, (*ii*) N-defence; (*iii*) N-affiliation, (*iv*) N-order.

(*b*) *Arts stream* : (*i*) N-achievement, (*ii*) N-aggression.
(*c*) *Commerce stream* · (*i*) N-intraception,
(*ii*) N-succorance, (*iii*) N-hetrosexuality, and
(*iv*) N-dominance.

The uniqueness of personality needs for science, arts and commerce students should prove a great asset in sorting the students for three streams only on the basis of non-intellective factors.

7. The six intellective factors and IAAI together accounted for a satisfactory proportion of the criterion variance.

(*a*) *Science stream* : The multiple R was .601 and thus 37 per cent of criterion variance was explained.
(*b*) *Arts stream* : The multiple R was 853 and thus 73 per cent of the criterion variance was explained.
(*c*) *Commerce stream* : The multiple R was .771 and thus 59 per cent criterion variance was explained.

It is seen that the multiple R for three streams are .60 for science, .85 for arts and .77 for commerce which go to indicate that the predictors obtained are highly satisfying In this connection we may quote the views of Guilford : "Concerning validity there seem to be common opinions that (i) validities of 50 to .60 are the practical upper limits of correlation between test scores and criteria of success; (ii) validities of .10 and 20 are so in consequential that test with such small predictive values are not worth using, even in test batteries; (iii) each test in a battery should have a maximum correlation with the practical criterion, (iv) after combining four or five tests in a battery, the validity of the composite cannot be materially increased by adding more tests ; (v) there would be no question concerning the utility of test with validities of .60 to .80 ; and (vi) tests are valid if by inspection they look valid."[1] Therefore, there is no question about the great utility of our predictors because the validity ranges between 60 and .85.

8. Seven prediction equations were worked out for each stream. An application of these was made to verify whether achievers could be discriminated from non-achievers in each stream. The equations which performed this function effectively were identified.

9. When the above seven predictors and the personality needs are

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[1] Guilford, J. P. New standards of test evaluation *Journal of Educational and Psychological Measurement*, 6,248, 1946

taken into account for predicting success in science, arts and commerce, they should be able to perform the task to an infallible extent practically.

The above findings are an original contribution to the existing knowledge as no such work has been attempted for university students using the structure of intellect factors at least in India and may be in some other countries. The work is valuable because significantly very high prediction validity coefficients have been obtained.

Appendix 1

SCIENCE STREAM

Criterion Correlation Coefficients for Science Stream (N=46)

S. No.	*Factor*	*B. Sc. Exam.*	*S. No.*	*Factor*	*B.Sc. Exam.*
1.	F_a	475**	10.	S_s-3	195
2.	F_e	.312*	11.	S_{ep}-3	.295*
3	F_t	172	12	R	.245*
4	F_w	195	13.	R_e-I	113
5.	I_w	322*	14	X_a	.115
6.	N	201	15.	X_s	250
7.	O	395**	16.	IES	.128
8.	R_s-I	88	17	IAAI	.446**
9	SI	013			

*Significant at .05 **Significant at .01

Step-wise Multiple Correlation Coefficients for B Sc. Examination (N=46)

Step No.	*Factor*	*R*	*R*	*Increment*	*F*	*df*
1.	F_a	475	.475	–	12.824	1–44
2.	S_s-3	195	.511	.036	7.615	2–43
3	IAAI	446	533	022	5 570	3–42
4	F_w	.195	.554	.021	4 560	4–41
5	S_{ep}-3	295	.573	.019	3 915	5–40
6.	O	.395	.586	.013	3 406	6–39
7.	F_l	172	.601	015	3.083	7–38

Prediction Equations for Science

$Y = .817\ F_a + 30.45$

$Y = 1\ 133\ F_a - .607\ S_s\text{-}3 + 34\ 69$

$Y = .843\ F_a - .682\ S_s\text{-}3 + 083\ \text{IAAI} + 23.96$

$Y = 1.036\ F_a - .738\ S_s\text{-}3 + .093\ \text{IAAI} - .\ 564\ F_w + 27.21$

$Y = 1.033\ F_a - .\ 580\ S_s\text{-}3 + .\ 167\ \text{IAAI} - 600\ F_w - 1.027\ S_{ep}\text{-}3 + 14.31$

$Y = .860\ F_a - .724\ S_s\text{-}3 + .\ 163\ \text{IAAI} - 161\ F_w - 1\ 432\ S_{ep}\text{-}3 - 195\ 0 + 17.21$

$Y = .938\ F_a - .807\ S_s\text{-}3 + .144\ \text{IAAI} - .608\ F_w - 1.525\ S_{ep}\text{-}3 + 288\ 0$
$- 053\ F_l + 22.38.$

Appendix 2

ARTS STREAM

Criterion Correlation Coefficients for Arts Stream ($N=44$)

S.No.	*Factor*	*B.A. Exam*	*S No*	*Factor*	*B.A. Exam.*
1.	F_a	.674**	10	S_q-3	.660**
2.	F_e	.765**	11.	S_{ep}-3	.616**
3.	F_i	.575**	12.	X_a	.5002**
4.	F_m	.650**	13.	X_g	.663**
5.	I	.651**	14.	IES	.042
6.	N	.561**	15.	IAAI	.673**
7.	O	619**			
8.	R_g-1	.467**			
9.	S-1	.219			

*Significant at .05 level **Significant at .01 level

Step-wise Multiple Correlation Coefficients for B.A. Examination ($N=44$)

Step No.	*Factor*	*r*	*R*	*Increment*	*F*	*df*
1.	F_e	.766	.765	—	59.262	1—42
2.	IAAI	.673	.787	022	33.541	2—41
3.	X_g	.663	.801	.014	23.963	3—40
4.	X_a	.500	825	024	16.294	4—39
5	I	.6514	.839	.014	14.695	5—38
6.	F_i	.5758	.848	.009	13.199	6—37
7.	S_g-3	.6630	.853	.005	11.758	7—36

Prediction Equations for Arts

$Y = .673\ F_e - 37.173$

$Y = .508\ F_e + .089\ IAAI + 24.284$

$Y = .411\ F_e + .073\ IAAI + .836\ X_g + 24.693$

$Y = .349\ F_e + .104\ IAAI + 1.183\ X_g - .352\ X_a + 8.976$

$Y = .222\ F_e + 122\ IAAI - .932\ X_g - .487\ X_a + .384\ I + 5.19$

$Y = .296\ F_e + .118\ IAAI + 1.121\ X_g - 121\ X_g - .426\ X_a + .493\ I$
$\quad - .044\ F_i + 215\ S_g\text{-}3 + 7.223$

Appendix 3

COMMERCE STREAM

Criterion Correlation Coefficients for Commerce Stream (N=49)

S No.	*Factor*	*B Com Exam.*	*S.No.*	*Factor*	*B. Com. Exam*
1	F_a	.463**	9.	S-1	.021
2.	F_e	.537**	10	S_s-3	.222
3.	F_i	.156	11.	S_{ep}-3	.478**
4	F_w	.409**	12.	X_a	.554**
5.	I	.506**	13	X_s	335**
6.	N	330**	14.	IES	222
7.	O	397**	15	IAAI	428**
8.	R_s-1	139			

*Significant at .05 level　　**Significant at 01 level

Step-wise Multiple Correlation Coefficients foi B Com. Examination (N=49)

Step No.	*Factoi*	*r*	*R*	*Increment*	*F*	*df*
1.	X_a	.554	554	—	11.535	1–47
2	F_e	537	592	038	6 771	2–46
3.	S_s-3	.222	669	.077	6 485	3–45
4	IAAI	.428	.735	.066	5 176	4–44
5.	N	.330	746	.011	4.403	5–43
6.	F_i	.156	.759	.013	3.892	6–42
7.	S_{ep}-3	478	.771	.012	3.482	7–41

Prediction Equations for Commerce

$Y = 570\, X_a + .09$

$Y = .369\, X_a + .358 F_e + 38\ 84$

$Y = .496\, X_a + .642 F_e - 1.397\, S_s\text{-}3 + 48.84$

$Y = .477\, X_a + 687 F_e - 1\ 865\, S_s\text{-}3 + 075\ \text{IAAI} + 69\ 574$

$Y = .441\, X_a + .688 F_e - 2.212\, S_s\text{-}3 + .070\ \text{IAAI} + 049\ N$
$+ 67\ 45$

$Y = .387\, X_a + .785\, F_e - 1\ 742\, S_s\text{-}3 \times .078\ \text{IAAI} + 054\ N$
$- 993\ F_i + 72\ 92$

$Y = .372\, X_a \times 663\ F_e - 1.519\, S_s\text{-}3 + .058\ \text{IAAI} \times .033\ N$
$- 1\ 636\ F_i + 2\ 146\, S_{ep}\text{-}3 + 79.92$

Appendix 4

Criterion Correlation Coefficient of EPPS Scores

S.No.	*Factor*	*Science*	*Arts*	*Commerce*
1.	Achievement	.1036	2885	– 0542
2.	Defence	2104	0571	– – 1485
3.	Order	1592	0912	–.0184
4.	Exhibition	– 0484	.4876	0411
5	Autonomy	0205	– .2666	.0985
6.	Affiliation	.1796	.5453	.0980
7.	Intraception	–.1673	– 1771	.2053
8.	Succourance	.0632	– –.4855	.2659
9.	Dominance	– 2930	– .1387	.1610
10.	Abasement	1349	.0784	–.2764
11	Nurturance	.0868	.0788	– –.1528
12.	Change	– 0858	.1973	.2751
13.	Endurance	.4075	0346	–.4374
14.	Hetrosexuality	– .4364	– 3955	.2682
15.	Aggression	–.1533	3401	.790

Book Reviews

Curriculum Innovation

Curriculum Innovation through Population Education. J E JAYASURIYA
Associated Educational Publishers, P. O. Box 603, Colombo, Sri Lanka,
1978, pp 121, Price · £ 3.00 or Rs 45.00

THE BOOK UNDER REVIEW is written by a person who was one time Unesco Regional Adviser on Population Education in Asia during 1971-76. This reflects his rich experience in the field and his commitment for institutionalizing population education as an innovative subject.

The book has eight main chapters followed by four appendices which cover concept, scope, content, issues, teaching methodology, curriculum development and research in population education. The author has competently dealt with the above-mentioned chapters, each of which is worth reading. From the practical point of view, they reflect realistic experiences in the field of population education presented in the form of a book. They could as well value as a model for a population education project in any country. The author has discussed the problems and issues in introducing population education. He has suggested a hypothetical chart for the organization of population education programme at the national level. This model has already been tested in several countries in Asia. It is a gift to administrators and policy-framers in population education.

Teaching methodology for population education has also been discussed by the author. While discussing the teaching methods Prof. Jayasuriya holds that explicit attention should be given to the process involved in clarifying values, planning and decision-making and problem-analysis and problem-solving. According to him there has been no shortage of variety in the methods used to teach population education What is lacking, however, is evidence of systematic attention to the development of process skills.

The author has mentioned the scope of curriculum innovation through population education. In this connection he has expressed his views that population education encompasses a survey of the past, distant as well as recent, the immediate present, the near as well as the distant future, and in this sense spans over time in a readable style. According to the author the curriculum innovation is necessary for future generation and planned parenthood.

About the population education research, the author has discussed the question of feasibility study before something new is attempted. Another deficiency in population education research relates to the magnitude of the sample that is normally studied. The author has particularly quoted a bad case in the Asian region about an anthropological study dealing with all the practices associated with birth, marriage, pregnancy, child birth, menopause and death, carried out in the name of population education. It yielded information valuable to a social anthropologist but absolutely irrelevant to a population educator. In fact, only about 50 pages of information, some of which marginally relevant to population education, have since been extracted out of this voluminous exercise and published in the form of a booklet.

The author complains about the lack of sophistication in the measuring instruments that are used in population education research. Perhaps this should be true of many other areas where research is currently being conducted.

He has mentioned the need for research in population education contents of textbooks and organization of content for teaching population education. This kind of valuable information for the development of multi-disciplinary research to promote the innovative subject of population education is an example of author's contribution in the field of educational innovations.

Besides the above-mentioned contribution of the author, his views on population education are also noteworthy for planners and educationists. There are four appendices included in this book which are fairly scholarly, particularly Appendix 3 'World peace through population education', which presents in a nutshell the implications of innovations through population education. For this contribution the author deserves our thanks. The book is on the whole useful for students, teachers, academicians, researchers, trainers, extension workers who lay a great store by innovations.

SOHANLAL NAGDA, Director and Head, Population Studies Centre,
S. V. University, Tirupati

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Manual for Community Health Workers

Communicability and Comprehensibility of the Manual for Community Health Workers. R. N. SRIVASTAVA, *et al.* Roopak Printers, Delhi, 1978 (Study sponsored and published by Unicef)

THE TITLE OF THE PUBLICATION is as transparent as the purpose of the study. First part consists of the evaluation report and the second of approach, method and techniques of analysis. In fact both volumes attract one's attention for their own distinct features The evaluation report, that is the first volume, is interesting for its content. Perhaps for the first time a serious attempt has been made to see whether a manual is functional and does the assigned job or not. Also, perhaps, for the first time a department of linguistics, has thought it fit to examine a Community Health Workers (CHWs) Manual. For this bringing together of two unlikely bedmates, as it were, the Unicef deserves our gratitude.

The new community health worker needs no introduction. As a result of government's realization that no programme would ever properly succeed unless people's cooperation was sought this rank got created. For the training of CHWs the Government of India launched a massive programme in 1977. The new CHW is selected from the village itself. The concept of 'Village Physician' is inspired by Chinese practice of 'Barefoot Doctors' and is as old as 1972. There are in operation as many as 741 Primary Health Centres (PHCs) covering about 74,000 villages. By June 1978, it was hoped that some 44,000 trained CHWs would be in the field The CHWs, on the whole, have been welcomed by villagers for their dedication to carry on their obligation even if no payment was made to them. For their orientation a manual was prepared with the collaboration of several institutions and individuals. The manual discharges three major functions :

1. It is a *supplementary book* of teaching/training programme.
2. It is a *reference book* for the CHW.
3. It is a *guide book* in preventive health, hygiene and in first-aid techniques for the village lay person.

The present project was undertaken to evaluate this manual in order to find out its communicability and comprehensibility by the CHWs for whom it was meant. And for these twin objects Prof. Srivastava and his team entered the fray with their expertise They accepted the manual as an event in a communication act. Any communication act takes place in a given social context and communication setting. Therefore, for proper evaluation factors, such as region and social strata, verbal repertoire of the community age, sex, education, economic status and caste, were taken to define the communication setting. The groups involved are both types, that is, those that are directly or indirectly involved. The selected two areas in Uttar Pradesh ('Uttar' being spelled as 'Utter') are in Mauranipur in Jhansi and Daurala in Meerut districts, for study.

The team interviewed some 55 trainees in all and 13 trainers. The total number of directly involved informants was 89. They were classified on age, sex, education, medium of instruction at school, caste, socio-economic status, etc. The informants varied differently with the following scale of bilingualism incipient, subordinate and coordinate.

The major findings constitute two points. The cttws can have full participation through the language of Hindi while the villagers can intereact only through dialect. The preference was also for simple Hindi.

On all linguistic points the manual was found wanting, e.g., in :

1. Orthographically sound,
2. Grammatically correct,
3. Structurally natural,
4. Semantically graspable,
5. Logically valid,
6. Stylistically appropriate, and
7. Functionally communicable.

Be that as it may, this publication should serve as a model for studying all such publications, more specially the manuals. For one thing, manual preparation is a highly technical job and once this technical aspect is overlooked, the very purpose of preparing manuals is lost. Recommended for all those interested in this work. The accompanying volume should be of even greater use than the first one as it explains the dynamics and design of such a study.

R. P. SINGH, Professor in Education, National Institute of Education,
NCERT, New Delhi ☐

A CORRECTION

In July 1979 issue of *Indian Educational Review* we carried an article entitled "Learning Through Seminars : An Experience" by M. S. Yadav, CASE, University of Baroda. Due to oversight the names of its co-authors, M B. Menon and (Km.) V. P. Vardhini were omitted in the article. The omission is regretted.

General Editor

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